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# RESEARCH MEMORANDUM

WIND-TUNNEL INVESTIGATION OF  
THE EFFECT OF SWEEP AND TAPER RATIO ON EFFECTIVENESS  
OF SPOILER-SLOT-DEFLECTOR CONTROLS ON  
ASPECT-RATIO-4 WINGS AT  
TRANSONIC SPEEDS

By Alexander D. Hammond and Linwood W. McKinney

Langley Aeronautical Laboratory  
Langley Field, Va.

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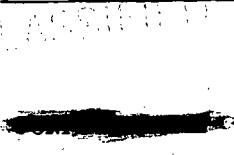
By Alexander D. Hammond and Linwood W. McKinney

SUMMARY

A wind-tunnel investigation has been performed in the Langley high-speed 7- by 10-foot tunnel by use of the transonic-bump technique to study the effect of wing sweep and taper ratio on spoiler-slot-deflector control effectiveness.

The investigation was made on aspect-ratio-4 wings with NACA 65A004 airfoil sections. The wings tested had 0°, 15°, 30°, and 45° sweep of the quarter-chord with a taper ratio of 1 for the 0° and 15° swept wings. Taper ratios of 0 and 1 for the 30° swept wing, and taper ratios of 0, 0.25, 0.50, and 1 for the 45° swept wings. Each of the wings was tested with a half-span spoiler-slot-deflector control with the spoiler projection set at -7.5 percent of the wing chord and the deflector projection varied to give ratios of deflector projection to spoiler projection of 0.50, 0.75, and 1.00. The spoiler was hinged on the upper surface of the wing on the 60-percent wing-chord line, and the deflector was hinged on the lower surface of the wing at the 70-percent wing-chord line. Tests were also made on full-span spoiler-slot-deflector controls located at the same position with a ratio of deflector projection to spoiler projection of 0.50 for the 0°, 30°, and 45° swept wings with a taper ratio of 1.00. All tests were made over a Mach number range from 0.60 to 1.10. The data are presented without discussion.

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\*Title, Unclassified. 

## INTRODUCTION

The design of spoiler-slot-deflector controls at transonic speeds is hampered by the lack of a satisfactory theoretical approach and the lack of systematic data on the effects of wing geometry. However, the effects of wing aspect ratio and chordwise location of the control are covered in references 1 and 2 for the spoiler-slot-deflector control and for the plain spoiler, respectively. There are a number of investigations of the lateral-control characteristics of spoiler-slot-deflector configurations (for example, see refs. 3 to 7) and the data of these investigations have shown certain advantages of the spoiler-slot-deflector combination over the plane spoiler, such as the good control effectiveness at high angles of attack of the spoiler-slot-deflector control.

The present paper presents the results of a wind-tunnel investigation made to determine the control effectiveness of spoiler-slot-deflector controls at transonic speeds. The variables investigated were wing sweep ( $0^\circ$ ,  $15^\circ$ ,  $30^\circ$ , and  $45^\circ$  sweepback), taper ratio (taper ratios of 0, 0.25, 0.50, and 1.00), and ratio of deflector projection to spoiler projection (projection ratios of 0.50, 0.75, and 1.00). The transonic speeds were obtained by using the transonic-bump technique in the Langley high-speed 7- by 10-foot tunnel.

In order to expedite the publication of the results of this investigation, no discussion of the data is presented. All the data are presented in tabular form and, in addition, some data showing significant trends are presented in graphic form.

## COEFFICIENTS AND SYMBOLS

The data are presented about the model wind axes with the origin on the wing-root-chord line at a longitudinal position corresponding to the quarter-chord of the mean aerodynamic chord.

$C_L$  lift coefficient,  $\frac{\text{Twice semispan lift}}{qS}$

$C_D$  drag coefficient,  $\frac{\text{Twice semispan drag}}{qS}$

$C_m$  pitching-moment coefficient about  $0.25\bar{c}$ ,  
 $\frac{\text{Twice semispan pitching moment}}{qS\bar{c}}$

$C_l$	rolling-moment coefficient, $\frac{\text{Semispan rolling moment}}{qSb}$
$C_n$	yawing-moment coefficient, $\frac{\text{Semispan yawing moment}}{qSb}$
$b$	wing span, ft
$c$	wing chord, ft
$\bar{c}$	wing mean aerodynamic chord, $\frac{2}{S} \int_0^{b/2} c^2 dy$ , ft
$S$	wing area, sq ft
$\Lambda_{c/4}$	wing sweep, measured at quarter-chord line
$A$	wing aspect ratio, $b^2/S$
$\lambda$	wing taper ratio
$q$	free-stream dynamic pressure, $\frac{1}{2}\rho V^2$ , lb/sq ft
$V$	free-stream velocity, ft/sec
$\rho$	free-stream density, slugs/cu ft
$R$	Reynolds number based on wing mean aerodynamic chord
$M$	free-stream Mach number
$M_l$	local Mach number
$\alpha$	angle of attack, deg
$\delta_s$	spoiler projection measured from wing surface (negative when projected above surface of wing), fraction of wing chord
$\delta_d$	deflector projection measured from wing surface (negative when projected below surface of wing), fraction of wing chord
$\frac{\delta_d}{\delta_s}$	ratio of deflector projection to spoiler projection
$\Delta C_L, \Delta C_m, \Delta C_D$	change in coefficient due to control deflection, difference between wing with control and plain wing

$$(x_{cp})_{\Delta C_N}$$

location of longitudinal center of pressure of incremental normal-force coefficient due to control projection, fraction of wing mean aerodynamic chord

## MODELS

The geometric characteristics of the models used in the investigation are given in figure 1. The basic models were machined from solid steel to an NACA 65A004 airfoil section. The models were all aspect-ratio-4 semispan wings with no twist or camber. Wings with 0° and 15° of sweep had a taper ratio of 1.00, the 30° swept wings had taper ratios of 0 and 1.00, and the 45° swept wings had taper ratios of 0, 0.25, 0.50, and 1.00.

The steel flap-type spoiler and deflector controls extended from the wing root chord to one-half the wing span for all models. In addition, three models were tested with the spoiler-slot-deflector controls extended from the wing root to the wing tip. The spoilers and deflectors had a chord of 10 percent of the wing chord. The slot also had a chord of 10 percent of the wing chord with the trailing edge of the slot located at the 70-percent chordwise station on the wing. The steel spoiler was hinged to the upper wing surface at the leading edge of the slot. The steel deflector was hinged to the lower wing surface at the trailing edge of the slot. The spoiler projection  $\delta_s$  was -0.075c for all the wings and the deflector projection  $\delta_d$  was varied to give ratios of deflector projection to spoiler projection  $\frac{\delta_d}{\delta_s}$  of 0.50, 0.75, and 1.00.

## TESTS

The tests were made by using the transonic-bump technique in the Langley high-speed 7- by 10-foot tunnel. The models were attached to a five-component electrical strain-gage balance beneath the bump surface. The tests were made over a Mach number range from 0.60 to 1.10. The variation of the local Mach number over the bump surface in the vicinity of one of the model locations for several Mach numbers is shown in figure 2. The test angles of attack varied generally from -4° to 20° whenever the loads encountered did not exceed the design limit of the balance. The tests were made with a spoiler projection of -0.075c and deflector projection varied to give ratios of deflector projection to spoiler projection of 0.50, 0.75, and 1.00. The range of Reynolds number for the models having various taper ratios is shown in figure 3.

## CORRECTIONS

The data have not been corrected for jet-boundary effects or blocking since the models were sufficiently small with respect to tunnel boundaries to make the correction negligible. The roll and yaw data presented represent the rolling- and yawing-moment coefficients resulting from deflection of the control on one wing. Since no reflection-plane corrections have been applied to the data, they represent symmetrically deflected controls and should be reduced if applied to antisymmetric deflection. The reflection-plane correction in terms of symmetrical rolling moment at  $M = 0$  is the ratio of the rolling moment due to antisymmetric control deflection, as determined from reference 8, to the rolling moment due to symmetrical control deflection, as determined from reference 9 for a given control span on a given wing plan form. The variation of the reflection-plane correction with Mach number has not been established in the transonic-speed range but there is no correction at supersonic speeds.

## RESULTS

The force and moment data obtained in this investigation are presented in tables I to VIII. A graphical presentation of some of the data for a ratio of deflector projection to spoiler projection ( $\delta_d/\delta_s$ ) of 0.750 is shown in figures 4 to 10. Typical variations of  $\Delta C_L$ ,  $\Delta C_D$ ,  $\Delta C_m$ , and  $(x_{cp})_{\Delta C_N}$  with the several test parameters are given in these figures. The variation of these incremental coefficients with angle of attack for the spoiler-slot-deflector configuration on the untapered wings having sweeps of  $0^\circ$ ,  $15^\circ$ ,  $30^\circ$ , and  $45^\circ$  and on the  $45^\circ$  swept wings having taper ratios of 0, 0.25, 0.50, and 1.00 is shown in figures 4 and 5, respectively. Figure 6 shows the effects of angle of attack on the variation of  $\Delta C_L$ ,  $\Delta C_D$ ,  $\Delta C_m$ , and  $(x_{cp})_{\Delta C_N}$  with Mach number for the spoiler-slot-deflector configuration on untapered wings having sweeps of  $0^\circ$ ,  $15^\circ$ ,  $30^\circ$ , and  $45^\circ$ . The effect of wing sweep and taper ratio on the variation of these incremental coefficients with Mach number is shown in figures 7 and 8, respectively, for the untapered wing and the  $45^\circ$  swept wing at angles of attack of  $4^\circ$ ,  $8^\circ$ , and  $16^\circ$ . The variation of  $\Delta C_L$ ,  $\Delta C_D$ ,  $\Delta C_m$ , and  $(x_{cp})_{\Delta C_N}$  for various angles of attack is plotted against sweep for the untapered wings and, against taper ratio for the  $45^\circ$  swept

wings at Mach numbers of 0.80, 0.90, and 1.00 in figures 9 and 10,  
respectively.

Langley Aeronautical Laboratory,  
National Advisory Committee for Aeronautics,  
Langley Field, Va., May 16, 1958.

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TABLE I. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 0° AND TAPER RATIO OF 1

## (a) Plain wing

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$											
-4	-0.3354	.0236	.0143	.0382	-.0002	-4	-0.4531	.0567	.0414	.0512	.0016
-2	-0.1932	.0181	.0189	.0212	-.0012	-2	-0.2773	.0258	.0067	.0301	.0004
0	-0.0383	.0163	.0176	.0039	-.0018	0	-0.0290	.0134	-.0170	.0034	-.0008
2	.0930	.0191	.0156	-.0120	-.0013	2	.1366	.0206	-.0318	-.0159	.0006
4	.2296	.0318	.0098	-.0282	.0010	4	.3538	.0330	-.0503	-.0230	.0030
6	.3846	.0499	.0065	-.0460	.0038	6	.5607	.0670	-.0909	-.0638	.0082
8	.5304	.0817	.0195	-.0645	.0085	8	.7262	.1123	-.1168	-.0842	.0147
10	.6397	.1298	.0541	-.0793	.0140	10	.8504	.1576	-.1390	-.0992	.0219
12	.6944	.1751	.0879	-.0886	.0198	12	.9849	.2143	-.1774	-.1152	.0306
16	.7218	.2450	.1211	-.0952	.0288	16	.1545	.3327	-.1959	-.1382	.0467
20	.7309	.3131	.1329	-.0961	.0375	20	.0801	.4018	-.2144	-.1329	.0543
$M = 0.80$											
-4	-0.4170	.0343	.0198	.0463	.0015	-4	-0.4429	.0640	.0495	.0481	.0039
-2	-0.2202	.0171	.0220	.0242	-.0004	-2	-0.2452	.0345	.0184	.0268	.0011
0	-0.0418	.0116	.0132	.0048	-.0013	0	-0.0475	.0246	-.0071	.0046	.0002
2	.1181	.0178	.0088	-.0141	-.0007	2	.1305	.0276	-.0283	-.0147	.0013
4	.3050	.0276	.0062	-.0352	.0013	4	.3184	.0404	-.0565	-.0367	.0036
6	.4809	.0508	.0044	-.0562	.0047	6	.5062	.0689	-.0883	-.0579	.0081
8	.6421	.0919	.0176	-.0758	.0098	8	.6644	.1083	-.1187	-.0762	.0139
10	.7159	.1317	.0527	-.0874	.0158	10	.8028	.1526	-.1456	-.0921	.0207
12	.7282	.1715	.0941	-.0912	.0220	12	.9215	.2068	-.1731	-.1070	.0286
16	.7651	.2437	.1288	-.0958	.0315	16	.1311	.3249	-.2212	-.1338	.0457
20	.7970	.3246	.1459	-.0994	.0412	20	.2695	.4578	-.2367	-.1524	.0654
$M = 0.85$											
-4	-0.4469	.0401	.0123	.0501	.0021	-4	-0.3969	.0567	.0475	.0447	.0038
-2	-0.2511	.0172	.0239	.0272	-.0003	-2	-0.2355	.0331	.0183	.0257	.0014
0	-0.0369	.0103	.0140	.0045	-.0013	0	-0.0456	.0236	-.0034	.0044	.0003
2	.1405	.0149	.0082	-.0158	-.0003	2	.1253	.0426	-.0285	-.0154	.0012
4	.3478	.0264	.0041	-.0394	.0021	4	.3058	.0378	-.0557	-.0343	.0038
6	.5321	.0539	.0173	-.0611	.0060	6	.4767	.0643	-.0848	-.0540	.0078
8	.6703	.0963	.0391	-.0809	.0118	8	.6381	.1040	-.1120	-.0732	.0135
10	.7855	.1376	.0576	-.0957	.0181	10	.7616	.1466	-.1371	-.0872	.0198
12	.8431	.1869	.0844	-.1045	.0249	12	.8945	.1986	-.1663	-.1025	.0274
16	.8085	.2523	.1379	-.0998	.0333	16	.6978	.3120	-.2206	-.1275	.0441
20	.8431	.3326	.1548	-.1026	.0431	20	.2573	.4539	-.2599	-.1490	.0646
$M = 0.90$											
-4	-0.4772	.0488	.0117	.0532	.0027	-4	-0.3925	.0530	.0459	.0438	.0039
-2	-0.2637	.0217	.0164	.0293	-.0001	-2	-0.2183	.0320	.0177	.0248	.0015
0	-0.0305	.0108	.0175	.0034	-.0011	0	-0.0385	.0210	-.0052	.0041	.0003
2	.1547	.0152	.0132	-.0179	.0001	2	.1302	.0228	-.0275	-.0134	.0013
4	.3617	.0271	.0179	-.0410	.0024	4	.2862	.0365	-.0518	-.0330	.0037
6	.5687	.0629	.0545	-.0662	.0072	6	.4512	.0621	-.0518	-.0515	.0077
8	.7212	.1052	.0818	-.0855	.0136	8	.5980	.0959	-.1049	-.0683	.0131
10	.8367	.1508	.1071	-.1008	.0206	10	.7356	.1397	-.1337	-.0836	.0193
12	.9239	.1964	.1110	-.1123	.0281	12	.8548	.1918	-.1619	-.0983	.0266
16	.8847	.2690	.1518	-.1082	.0362	16	.0492	.3041	-.2111	-.1225	.0424
20	.9173	.3580	.1810	-.1101	.0465	20	.1960	.4292	-.2379	-.1404	.0623
$M = 1.00$											
-4	-0.4429	.0640	.0495	.0481	.0039	-4	-0.3969	.0567	.0475	.0447	.0038
-2	-0.2452	.0345	.0184	.0268	.0011	-2	-0.2355	.0331	.0183	.0257	.0014
0	-0.0475	.0246	-.0071	.0046	.0002	0	-0.0456	.0236	-.0034	.0044	.0003
2	.1305	.0276	-.0283	-.0147	.0013	2	.1253	.0426	-.0285	-.0154	.0012
4	.3184	.0404	-.0565	-.0367	.0036	4	.3058	.0378	-.0557	-.0343	.0038
6	.5062	.0689	-.0883	-.0579	.0081	6	.4767	.0643	-.0848	-.0540	.0078
8	.6644	.1083	-.1187	-.0762	.0139	8	.6381	.1040	-.1120	-.0732	.0135
10	.8028	.1526	-.1456	-.0921	.0207	10	.7616	.1466	-.1371	-.0872	.0198
12	.9215	.2068	-.1731	-.1070	.0286	12	.8945	.1986	-.1663	-.1025	.0274
16	.1311	.3249	-.2212	-.1338	.0457	16	.6978	.3120	-.2206	-.1275	.0441
20	.2695	.4578	-.2367	-.1524	.0654	20	.2573	.4539	-.2599	-.1490	.0646
$M = 1.05$											
-4	-0.3969	.0567	.0475	.0447	.0038	-4	-0.3969	.0567	.0475	.0447	.0038
-2	-0.2355	.0331	.0183	.0257	.0014	-2	-0.2355	.0331	.0183	.0257	.0014
0	-0.0456	.0236	-.0034	.0044	.0003	0	-0.0456	.0236	-.0034	.0044	.0003
2	.1253	.0426	-.0285	-.0154	.0012	2	.1253	.0426	-.0285	-.0154	.0012
4	.3058	.0378	-.0557	-.0343	.0038	4	.3058	.0378	-.0557	-.0343	.0038
6	.4767	.0643	-.0848	-.0540	.0078	6	.4767	.0643	-.0848	-.0540	.0078
8	.6381	.1040	-.1120	-.0732	.0135	8	.6381	.1040	-.1120	-.0732	.0135
10	.7616	.1466	-.1371	-.0872	.0198	10	.7616	.1466	-.1371	-.0872	.0198
12	.8945	.1986	-.1663	-.1025	.0274	12	.8945	.1986	-.1663	-.1025	.0274
16	.6978	.3120	-.2206	-.1275	.0441	16	.6978	.3120	-.2206	-.1275	.0441
20	.2573	.4539	-.2599	-.1490	.0646	20	.2573	.4539	-.2599	-.1490	.0646
$M = 1.10$											
-4	-0.3925	.0530	.0459	.0438	.0039	-4	-0.3925	.0530	.0459	.0438	.0039
-2	-0.2183	.0320	.0177	.0248	.0015	-2	-0.2183	.0320	.0177	.0248	.0015
0	-0.0385	.0210	-.0052	.0041	.0003	0	-0.0385	.0210	-.0052	.0041	.0003
2	.1302	.0228	-.0275	-.0134	.0013	2	.1302	.0228	-.0275	-.0134	.0013
4	.2862	.0365	-.0518	-.0330	.0037	4	.2862	.0365	-.0518	-.0330	.0037
6	.4512	.0621	-.0518	-.0330	.0037	6	.4512	.0621	-.0518	-.0330	.0037
8	.5980	.0959	-.1049	-.0683	.0131	8	.5980	.0959	-.1049	-.0683	.0131
10	.7356	.1397	-.1337	-.0836	.0193	10	.7356	.1397	-.1337	-.0836	.0193
12	.8548	.1918	-.1619	-.0983	.0266	12	.8548	.1918	-.1619	-.0983	.0266
16	.0492	.3041	-.2111	-.1225	.0424	16	.0492	.3041	-.2111	-.1225	.0424
20	.1960	.4292	-.2379	-.1404	.0623	20	.1960	.4292	-.2379	-.1404	.0623

**TABLE I. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 0° AND TAPER RATIO OF 1 - Continued**

(b) Full-span spoiler slot deflector;  $\delta_s = -0.075$ ;  $\delta_d/\delta_s = 0.50$

$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
<b>M = 0.60</b>										<b>M = 0.95</b>	
-4	-0.7838	.1618	.0590	.0896	.0205	-4	-0.7949	.2228	.0913	.0883	.0268
-2	-0.7012	.1462	.0721	.0805	.0180	-2	-0.6802	.1943	.0746	.0754	.0238
0	-0.5819	.1316	.0846	.0666	.0162	0	-0.4507	.1735	.0541	.0525	.0218
2	-0.4809	.1234	.0918	.0556	.0148	2	-0.3046	.1631	.0652	.0377	.0208
4	-0.3836	.1151	.0964	.0443	.0139	4	-0.1586	.1553	.0746	.0225	.0199
6	-0.2239	.1024	.0945	.0267	.0130	6	.0292	.1579	.0820	.0021	.0202
8	-0.0587	.1033	.0918	.0085	.0125	8	.2692	.1761	.0522	-0.0247	.0231
10	.1523	.1252	.0676	-0.0154	.0157	10	.4110	.1984	.0410	-0.0416	.0266
12	.2900	.1499	.0387	-0.0327	.0195	12	.5300	.2306	.0280	-0.0568	.0314
16	.4369	.1992	.0000	-0.0544	.0283	16	.6239	.2794	-0.0093	-0.0716	.0390
20	.5378	.2641	.0262	-0.0673	.0358	20	.6552	.3262	-0.0354	-0.0765	.0447
<b>M = 0.80</b>										<b>M = 1.00</b>	
-4	-0.8847	.2017	.0797	.0961	.0231	-4	-0.7401	.2230	.0748	.0827	.0273
-2	-0.7162	.1690	.0731	.0798	.0196	-2	-0.6204	.1682	.0588	.0687	.0236
0	-0.5551	.1474	.0819	.0628	.0171	0	-0.4309	.1634	.0463	.0495	.0211
2	-0.4411	.1382	.0930	.0511	.0158	2	-0.2753	.1574	.0499	.0335	.0203
4	-0.3271	.1259	.1018	.0376	.0143	4	-0.1416	.1485	.0563	.0176	.0192
6	-0.1660	.1185	.1072	.0197	.0134	6	.0778	.1554	.0581	-0.0043	.0201
8	.0198	.1197	.1049	.0006	.0135	8	.2972	.1758	.0339	-0.0290	.0231
10	.2429	.1536	.0708	-0.0244	.0191	10	.4369	.2006	.0135	-0.0458	.0273
12	.3172	.1629	.0500	-0.0365	.0204	12	.5625	.2379	-0.0071	-0.0611	.0323
16	.4411	.2141	.0190	-0.0541	.0282	16	.7361	.3019	-0.0410	-0.0834	.0420
20	.5526	.2708	.0186	-0.0671	.0353	20	.8957	.4012	-0.0820	-0.1021	.0545
<b>M = 0.85</b>										<b>M = 1.05</b>	
-4	-0.8978	.2102	.0928	.0969	.0241	-4	-0.7149	.2180	.0719	.0794	.0265
-2	-0.7470	.1784	.0829	.0816	.0213	-2	-0.6056	.1832	.0582	.0668	.0229
0	-0.5196	.1525	.0788	.0588	.0183	0	-0.4331	.1594	.0479	.0489	.0204
2	-0.4106	.1450	.0974	.0481	.0177	2	-0.2606	.1546	.0462	.0315	.0197
4	-0.2830	.1351	.1090	.0340	.0165	4	-0.1073	.1450	.0548	.0151	.0187
6	-0.1137	.1294	.1194	.0163	.0160	6	.1035	.1536	.0507	-0.0080	.0197
8	.0835	.1409	.1132	-0.0038	.0174	8	.3047	.1713	.0274	-0.0302	.0231
10	.2737	.1629	.0746	-0.0270	.0208	10	.4389	.1975	.0086	-0.0455	.0270
12	.3549	.1900	.0555	-0.0393	.0250	12	.5443	.2300	-0.0103	-0.0594	.0313
16	.4477	.2333	.0269	-0.0530	.0314	16	.7264	.2996	-0.0479	-0.0827	.0369
20	.5405	.2876	.0083	-0.0644	.0384	20	.8893	.3903	-0.0890	-0.1027	.0538
<b>M = 0.90</b>										<b>M = 1.10</b>	
-4	-0.8416	.2183	.0927	.0924	.0250	-4	-0.7145	.2138	.0728	.0778	.0261
-2	-0.7603	.1964	.0942	.0820	.0232	-2	-0.5794	.1783	.0579	.0645	.0179
0	-0.5449	.1789	.0981	.0628	.0225	0	-0.4368	.1539	.0489	.0487	.0195
2	-0.4087	.1679	.1099	.0487	.0211	2	-0.2517	.1493	.0446	.0309	.0192
4	-0.2549	.1499	.1158	.0324	.0193	4	-0.1129	.1401	.0529	.0146	.0184
6	-0.0571	.1444	.1209	.0149	.0186	6	.1185	.1493	.0446	-0.0106	.0198
8	.1516	.1570	.1040	-0.0109	.0204	8	.2851	.1700	.0232	-0.0304	.0229
10	.3164	.1772	.0824	-0.0320	.0238	10	.4054	.1954	.0060	-0.0445	.0271
12	.4263	.2046	.0550	-0.0461	.0279	12	.5164	.2295	-0.0132	-0.0580	.0314
16	.5252	.2511	.0137	-0.0604	.0346	16	.6830	.2940	-0.0463	-0.0793	.0403
20	.5977	.3052	.0196	-0.0694	.0417	20	.8589	.3862	-0.0900	-0.0999	.0533

TABLE I. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 0° AND TAPER RATIO OF 1 - Continued

(c) Half-span spoiler slot deflector;  $\delta_s = -0.075$ ;  $\delta_d/\delta_s = 0.50$

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$						$M = 0.95$					
$M = 0.80$						$M = 1.00$					
-4	-0.5908	.0929	.0291	.0582	.0063	-4	-0.6851	.1424	.0882	.0687	.0109
-2	-0.4730	.0785	.0324	.0435	.0046	-2	-0.5267	.1117	.0698	.0518	.0079
0	-0.3371	.0686	.0408	.0287	.0038	0	-0.3354	.0860	.0526	.0296	.0056
2	-0.2284	.0641	.0473	.0171	.0031	2	-0.1461	.0784	.0478	.0093	.0055
4	-0.1015	.0614	.0460	.0016	.0033	4	-0.0944	.0784	.0515	-0.0123	.0060
6	.0580	.0659	.0453	-0.0164	.0038	6	.2860	.0886	.0386	-0.0405	.0094
8	.02429	.0875	.0324	-0.0380	.0076	8	.4609	.1168	.0092	-0.0617	.0143
10	.04241	.1200	.0000	-0.0590	.0129	10	.6254	.1542	-0.0257	-0.0810	.0206
12	.05473	.1552	.0317	-0.0728	.0268	12	.7386	.1962	-0.0515	-0.0958	.0275
16	.06325	.2193	.0693	-0.0860	.0281	16	.9546	.2899	-0.1029	-0.1216	.0430
20	.06833	.2887	.0920	-0.0903	.0376	20	.9649	.3616	-0.1617	-0.1187	.0523
$M = 0.85$						$M = 1.05$					
-4	-0.6996	.1175	.0393	.0698	.0078	-4	-0.6322	.1461	.0746	.0648	.0115
-2	-0.5284	.0920	.0385	.0494	.0054	-2	-0.4648	.1118	.0549	.0472	.0080
0	-0.3571	.0773	.0481	.0300	.0038	0	-0.2876	.0873	.0387	.0270	.0059
2	-0.2397	.0725	.0568	.0170	.0032	2	-0.1004	.0775	.0317	.0067	.0057
4	-0.0881	.0676	.0612	.0006	.0036	4	.1261	.0799	.0317	-0.0177	.0061
6	.0954	.0719	.0629	-0.0201	.0046	6	.3230	.0946	.0056	-0.0438	.0104
8	.3033	.0920	.0538	-0.0431	.0086	8	.5003	.1240	-0.0296	-0.0641	.0152
10	.4746	.1236	.0066	-0.0647	.0143	10	.6381	.1584	-0.0542	-0.0803	.0210
12	.5651	.1602	.0293	-0.0750	.0201	12	.7662	.2040	-0.0845	-0.0958	.0282
16	.6433	.2180	.0677	-0.0832	.0286	16	.9730	.2971	-0.1337	-0.1201	.0434
20	.7192	.2941	.0983	-0.0917	.0394	20	.1384	.4226	-0.1830	-0.1417	.0614
$M = 0.90$						$M = 1.10$					
-4	-0.7063	.1284	.0619	.0718	.0093	-4	-0.5762	.1362	.0671	.0596	.0117
-2	-0.5763	.0987	.0569	.0557	.0062	-2	-0.4303	.1071	.0489	.0428	.0085
0	-0.3488	.0825	.0554	.0304	.0048	0	-0.2662	.0844	.0371	.0244	.0066
2	-0.1972	.0771	.0631	.0139	.0044	2	-0.0930	.0740	.0313	.0070	.0058
4	-0.0238	.0734	.0712	-0.050	.0046	4	.1167	.0785	.0163	-0.0187	.0069
6	.2145	.0825	.0650	-0.0323	.0074	6	.3082	.0958	-0.0143	-0.0414	.0107
8	.4420	.1084	.0348	-0.0583	.0123	8	.4723	.1239	-0.0424	-0.0607	.0152
10	.5828	.1392	.0108	-0.0770	.0179	10	.6090	.1589	-0.0665	-0.0771	.0207
12	.7128	.1834	.0155	-0.0939	.0253	12	.7184	.2034	-0.0912	-0.0912	.0269
16	.7128	.2379	.0801	-0.0898	.0321	16	.9080	.2932	-0.1368	-0.1130	.0406
20	.7995	.3193	.1219	-0.1002	.0437	20	.0721	.4158	-0.1922	-0.1349	.0585

TABLE I. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 0° AND TAPER RATIO OF 1 - Continued

(d) Half-span spoiler slot deflector;  $\delta_s = -0.075$ ;  $\delta_d/\delta_s = 0.75$ 

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$						$M = 0.95$					
$M = 0.80$						$M = 1.00$					
-4	-0.5871	.1140	.0296	.0579	.0081	-4	-0.6230	.1391	.0573	.0634	.0106
-2	-0.4454	.0905	.0351	.0420	.0065	-2	-0.4926	.1134	.0462	.0482	.0076
0	-0.3145	.0833	.0409	.0261	.0053	0	-0.2856	.0979	.0388	.0255	.0062
2	-0.2181	.0815	.0513	.0146	.0050	2	-0.1366	.0927	.0444	.0083	.0060
4	-0.0927	.0805	.0539	.0006	.0050	4	.0600	.0876	.0518	-0.0129	.0064
6	.0545	.0833	.0546	-0.0167	.0058	6	.0273	.1010	.0370	-0.0377	.0098
8	.2363	.1077	.0419	-0.0378	.0098	8	.4429	.1237	.0129	-0.0583	.0147
10	.4145	.1376	.0104	-0.0573	.0151	10	.5878	.1597	-0.0148	-0.0767	.0206
12	.5181	.1720	.0182	-0.0708	.0203	12	.7120	.2040	-0.0425	-0.0915	.0274
16	.5926	.2308	.0572	-0.0806	.0292	16	.8983	.2968	-0.0851	-0.1148	.0416
20	.6399	.3005	.0757	-0.0862	.0385	20	.9604	.3864	-0.1387	-0.1234	.0444
$M = 0.85$						$M = 1.05$					
-4	-0.7219	.1362	.0409	.0722	.0103	-4	-0.5981	.1465	.0617	.0605	.0118
-2	-0.4989	.1030	.0224	.0472	.0071	-2	-0.4652	.1182	.0472	.0458	.0088
0	-0.3058	.0893	.0351	.0256	.0058	0	-0.2848	.0964	.0329	.0249	.0067
2	-0.1724	.0836	.0499	.0108	.0056	2	-0.1044	.0879	.0278	.0054	.0062
4	-0.0207	.0801	.0594	-0.0059	.0058	4	.1139	.0898	.0268	-0.0184	.0072
6	.1609	.0904	.0635	-0.0276	.0076	6	.3038	.1040	.0014	-0.0406	.0108
8	.3793	.1133	.0468	-0.0518	.0121	8	.4500	.1304	-0.0258	-0.0590	.0154
10	.5288	.1454	.0216	-0.0705	.0176	10	.5848	.1654	-0.0495	-0.0745	.0209
12	.5563	.1774	.0146	-0.0744	.0224	12	.6835	.2032	-0.0716	-0.0878	.0271
16	.6207	.2392	.0528	-0.0817	.0313	16	.8828	.2930	-0.1123	-0.1109	.0412
$M = 0.90$						$M = 1.10$					
-4	-0.6559	.1313	.0467	.0662	.0098	-4	-0.5776	.1397	.0613	.0584	.0116
-2	-0.5251	.1031	.0380	.0504	.0070	-2	-0.4438	.1123	.0465	.0432	.0085
0	-0.3072	.0900	.0399	.0267	.0055	0	-0.2659	.0940	.0341	.0240	.0066
2	-0.1656	.0846	.0539	.0110	.0052	2	-0.0917	.0849	.0301	.0046	.0061
4	-0.0065	.0792	.0623	-0.0062	.0055	4	.0367	.0895	.0193	-0.0195	.0075
6	.2048	.0922	.0574	-0.0313	.0081	6	.2934	.1050	-0.0036	-0.0413	.0113
8	.4118	.1139	.0341	-0.0545	.0126	8	.4309	.1324	-0.0249	-0.0570	.0150
10	.5535	.1497	.0156	-0.0730	.0184	10	.5501	.1671	-0.0495	-0.0722	.0204
12	.6733	.1931	.0049	-0.0877	.0251	12	.6601	.2054	-0.0698	-0.0851	.0262
16	.6624	.2408	.0613	-0.0851	.0319	16	.8344	.2922	-0.1084	-0.1068	.0394
20	.7822	.3255	.1051	-0.0970	.0438	20	.0012	.4063	-0.1527	-0.1269	.0566

**TABLE I.** - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH

**SWEET OF 0° AND TAPER RATIO OF 1 - Concluded**

(e) Half-span spoiler slot deflector;  $\delta_S = -0.075$ ;  $\delta_d/\delta_s = 1.00$

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$											
-4	-.5102	.0998	.0339	.0523	.0078	-4	-.5998	.1442	.0495	.0638	.0108
-2	-.3772	.0898	.0280	.0367	.0067	-2	-.4654	.1164	.0370	.0459	.0081
0	-.2551	.0862	.0352	.0222	.0062	0	-.2523	.1030	.0336	.0214	.0074
2	-.1640	.0816	.0417	.0117	.0058	2	-.1241	.0978	.0443	.0058	.0071
4	-.0547	.0816	.0456	-.0016	.0057	4	.0517	.0978	.0532	-.0124	.0074
6	.0692	.0862	.0514	-.0164	.0058	6	.2689	.1061	.0429	-.0370	.0104
8	.2186	.1070	.0449	-.0346	.0092	8	.4344	.1370	.0174	-.0588	.0156
10	.3826	.1361	.0189	-.0538	.0143	10	.5791	.1751	-.0103	-.0767	.0220
12	.4737	.1678	.0052	-.0663	.0195	12	.6826	.2142	-.0281	-.0900	.0283
16	.5466	.2250	.0365	-.0764	.0281	16	.8377	.2986	-.0680	-.1080	.0246
20	.5921	.2857	.0547	-.0811	.0365	20	.8273	.3656	-.1168	-.1080	.0491
$M = 0.80$											
-4	-.5535	.1182	.0202	.0571	.0084	$M = 1.00$					
-2	-.4084	.1010	.0180	.0394	.0064	-4	-.5930	.1526	.0597	.0623	.0117
0	-.2583	.0919	.0308	.0223	.0057	-2	-.4744	.1279	.0438	.0457	.0090
2	-.1476	.0888	.0396	.0097	.0058	0	-.2471	.1083	.0314	.0210	.0077
4	-.0086	.0857	.0457	-.0057	.0061	2	-.0890	.1033	.0385	.0042	.0077
6	.1415	.0919	.0523	-.0240	.0070	4	.0988	.1033	.0431	-.0178	.0080
8	.3137	.1133	.0396	-.0444	.0110	6	.3163	.1181	.0194	-.0430	.0119
10	.4613	.1439	.0026	-.0617	.0163	8	.4645	.1476	-.0127	-.0609	.0167
12	.5412	.1794	.0180	-.0727	.0215	10	.5930	.1801	-.0374	-.0772	.0224
16	.5658	.2315	.0400	-.0769	.0289	12	.7116	.2244	-.0657	-.0917	.0293
20	.6396	.2970	.0593	-.0843	.0382	16	.8896	.3149	-.1063	-.1148	.0431
$M = 0.85$											
-4	-.6266	.1290	.0329	.0645	.0095	$M = 1.05$					
-2	-.4262	.1032	.0165	.0418	.0069	-4	-.5789	.1512	.0658	.0605	.0121
0	-.2534	.0935	.0305	.0223	.0061	-2	-.4460	.1276	.0478	.0439	.0091
2	-.1382	.0889	.0395	.0085	.0063	0	-.2467	.1087	.0312	.0215	.0075
4	.0069	.0849	.0477	-.0079	.0061	2	-.0759	.0992	.0353	.0033	.0074
6	.1728	.0946	.0531	-.0272	.0080	4	.1234	.1039	.0346	-.0195	.0079
8	.3570	.1176	.0424	-.0491	.0122	6	.3132	.1210	.0047	-.0431	.0121
10	.5068	.1479	.0181	-.0677	.0173	8	.4555	.1465	-.0190	-.0601	.0164
12	.5828	.1824	.0189	-.0765	.0227	10	.5694	.1795	-.0437	-.0748	.0218
16	.5989	.2380	.0457	-.0793	.0303	12	.6833	.2202	-.0671	-.0878	.0280
20	.6680	.3039	.1395	-.0878	.0404	16	.8636	.3071	-.1089	-.1112	.0420
$M = 0.90$											
-4	-.6535	.1356	.0424	.0671	.0104	$M = 1.10$					
-2	-.4792	.1084	.0253	.0457	.0077	-4	-.5591	.1515	.0652	.0585	.0117
0	-.2614	.0965	.0319	.0226	.0066	-2	-.4216	.1214	.0478	.0421	.0090
2	-.1307	.0900	.0413	.0082	.0066	0	-.2383	.1031	.0318	.0212	.0074
4	.0283	.0900	.0522	-.0091	.0067	2	-.0733	.0958	.0324	.0027	.0072
6	.2287	.1030	.0522	-.0323	.0094	4	.1283	.1050	.0269	-.0204	.0080
8	.4139	.1247	.0335	-.0546	.0137	6	.2933	.1232	.0013	-.0416	.0118
10	.5554	.1573	.0144	-.0731	.0194	8	.4491	.1533	-.0265	-.0596	.0160
12	.6644	.1985	.0043	-.0877	.0259	10	.5591	.1825	-.0491	-.0738	.0211
16	.6426	.2473	.0510	-.0824	.0318	12	.6599	.2236	-.0707	-.0863	.0272
20	.7188	.3232	.0802	-.0933	.0428	16	.8304	.3085	-.1084	-.1077	.0399

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 15° AND TAPER RATIO OF 1

## (a) Plain wing

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$		$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$											$M = 0.95$	
-4	-0.3430	0.0309	0.0059	0.0381	0.0015		-4	-0.4515	0.0557	0.0426	0.0520	0.0039
-2	-0.2208	0.0263	0.0013	0.0242	0.0007		-2	-0.2651	0.0330	0.0226	0.0300	0.0015
0	-0.0639	0.0227	0.0072	0.0069	0.0003		0	-0.0580	0.0175	0.0104	0.0060	0.0004
2	0.0730	0.0263	0.0104	-0.0100	0.0003		2	0.1450	0.0217	0.0000	-0.0163	0.0015
4	0.1952	0.0354	0.0202	-0.0250	0.0013		4	0.3252	0.0351	-0.0137	-0.0376	0.0036
6	0.3412	0.0491	0.0300	-0.0412	0.0040		6	0.5012	0.0557	-0.0374	-0.0589	0.0076
8	0.4963	0.0836	0.0300	-0.0591	0.0083		8	0.6669	0.0969	-0.0755	-0.0791	0.0135
10	0.6130	0.1226	0.0033	-0.0736	0.0138		10	0.8119	0.1382	-0.1018	-0.0961	0.0202
12	0.6969	0.1671	0.0306	-0.0837	0.0200		12	0.9362	0.1877	-0.1247	-0.1121	0.0279
16	0.7334	0.2307	0.0691	-0.0872	0.0280		16	0.1474	0.2929	-0.1680	-0.1376	0.0439
20	0.7280	0.2943	0.0776	-0.0853	0.0347		20	0.1267	0.3754	-0.1399	-0.1245	0.0511
$M = 0.80$											$M = 1.00$	
-4	-0.4105	0.0381	0.0145	0.0460	0.0023		-4	-0.4214	0.0581	0.0495	0.0486	0.0051
-2	-0.2441	0.0239	0.0053	0.0270	0.0008		-2	-0.2434	0.0355	0.0247	0.0276	0.0022
0	-0.0530	0.0178	0.0035	0.0057	0.0001		0	-0.0356	0.0266	0.0078	0.0041	0.0014
2	0.0949	0.0196	0.0128	-0.0118	0.0003		2	0.1326	0.0266	-0.0035	-0.0147	0.0027
4	0.2614	0.0270	0.0264	-0.0306	0.0024		4	0.3007	0.0374	-0.0205	-0.0349	0.0047
6	0.4401	0.0454	0.0357	-0.0513	0.0054		6	0.4590	0.0581	-0.0474	-0.0552	0.0087
8	0.6214	0.0810	0.0335	-0.0731	0.0103		8	0.6173	0.0906	-0.0700	-0.0737	0.0137
10	0.7446	0.1209	0.0084	-0.0868	0.0161		10	0.7459	0.1290	-0.0940	-0.0891	0.0195
12	0.7323	0.1578	0.0405	-0.0853	0.0208		12	0.8745	0.1783	-0.1181	-0.1044	0.0264
16	0.7940	0.2326	0.0727	-0.0908	0.0299		16	0.0882	0.2798	-0.1605	-0.1298	0.0418
20	0.8014	0.3002	0.0881	-0.0908	0.0377		20	0.2623	0.4127	-0.2043	-0.1515	0.0607
$M = 0.85$											$M = 1.05$	
-4	-0.4454	0.0425	0.0120	0.0492	0.0025		-4	-0.4046	0.0558	0.0482	0.0462	0.0047
-2	-0.2608	0.0247	0.0087	0.0281	0.0011		-2	-0.2242	0.0359	0.0231	0.0267	0.0026
0	-0.0646	0.0167	0.0037	0.0059	0.0000		0	-0.0342	0.0255	0.0088	0.0039	0.0017
2	0.1085	0.0190	0.0169	-0.0132	0.0009		2	0.1178	0.0255	-0.0007	-0.0132	0.0026
4	0.2885	0.0270	0.0284	-0.0336	0.0030		4	0.2888	0.0369	-0.0197	-0.0335	0.0049
6	0.4892	0.0483	0.0268	-0.0567	0.0064		6	0.4502	0.0586	-0.0434	-0.0529	0.0085
8	0.6623	0.0856	0.0037	-0.0792	0.0119		8	0.5927	0.0889	-0.0645	-0.0703	0.0130
10	0.8008	0.1275	0.0132	-0.0954	0.0183		10	0.7162	0.1267	-0.0883	-0.0846	0.0187
12	0.8585	0.1718	0.0317	-0.0984	0.0237		12	0.8397	0.1740	-0.1113	-0.0992	0.0255
16	0.8308	0.2378	0.0788	-0.0941	0.0314		16	0.0448	0.2733	-0.1527	-0.1236	0.0401
20	0.8423	0.3091	0.0985	-0.0964	0.0400		20	0.2044	0.3991	-0.1962	-0.1445	0.0580
$M = 0.90$											$M = 1.10$	
-4	-0.4753	0.0478	0.0097	0.0519	0.0031		-4	-0.3812	0.0520	0.0445	0.0446	0.0047
-2	-0.2725	0.0250	0.0043	0.0291	0.0010		-2	-0.2218	0.0329	0.0216	0.0257	0.0025
0	-0.0610	0.0152	0.0051	0.0062	0.0001		0	-0.0330	0.0246	0.0072	0.0116	0.0017
2	0.1308	0.0152	0.0175	-0.0147	0.0010		2	0.1136	0.0265	-0.0026	-0.0135	0.0025
4	0.3205	0.0261	0.0195	-0.0375	0.0030		4	0.2603	0.0383	-0.0170	-0.0315	0.0044
6	0.5232	0.0510	0.0035	-0.0607	0.0072		6	0.4069	0.0584	-0.0393	-0.0496	0.0075
8	0.6911	0.0912	0.0362	-0.0816	0.0131		8	0.5627	0.0903	-0.0675	-0.0676	0.0122
10	0.8219	0.1324	0.0600	-0.0975	0.0196		10	0.6818	0.1268	-0.0845	-0.0816	0.0174
12	0.9309	0.1780	0.0709	-0.1105	0.0264		12	0.7918	0.1725	-0.1074	-0.0961	0.0234
16	0.8982	0.2464	0.0822	-0.1004	0.0332		16	0.0081	0.2729	-0.1467	-0.1196	0.0372
20	0.9527	0.3354	0.1204	-0.1098	0.0447		20	0.1620	0.3869	-0.1860	-0.1391	0.0536

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH

SWEEP OF 15° AND TAPER RATIO OF 1 - Continued

(b) Half-span spoiler slot deflector;  $\delta_s = -0.075c$ ;  $\delta_d/\delta_s = 0.50$ 

$\alpha_s$ deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$	$\alpha_s$ deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$
$M = 0.60$						$M = 0.95$					
$M = 0.80$						$M = 1.00$					
-4	-0.6069	.0920	.0078	.0627	.0078	-4	-0.6419	.1362	.0445	.0708	.0111
-2	-0.4837	.0749	.0000	.0487	.0061	-2	-0.4732	.1065	.0195	.0502	.0079
0	-0.3660	.0658	.0097	.0332	.0053	0	-0.2921	.0860	.0176	.0277	.0064
2	-0.2482	.0604	.0149	.0208	.0050	2	-0.1276	.0804	.0232	.0109	.0065
4	-0.1123	.0577	.0227	.0053	.0046	4	.0267	.0758	.0379	-.0070	.0061
6	.0290	.0595	.0233	-.0115	.0045	6	.0222	.0860	.0636	-.0305	.0080
8	.02047	.0803	.0252	-.0320	.0070	8	.3971	.1070	.0268	-.0525	.0117
10	.03787	.1137	.0058	-.0515	.0122	10	.5514	.1373	-.0099	-.0710	.0169
12	.5163	.1470	.0227	-.0652	.0179	12	.7057	.1834	-.0393	-.0909	.0237
16	.6414	.2138	.0563	-.0769	.0268	16	.9629	.2848	-.1055	-.1209	.0392
20	.6613	.2769	.0693	-.0794	.0341	20	.0205	.3667	-.1375	-.1226	.0492
$M = 0.85$						$M = 1.05$					
-4	-0.7272	.1115	.0026	.0749	.0089	-4	-0.5737	.1321	.0309	.0634	.0110
-2	-0.5240	.0866	.0079	.0528	.0064	-2	-0.4224	.1042	.0098	.0449	.0083
0	-0.3673	.0738	.0232	.0350	.0051	0	-0.2397	.0866	.0021	.0244	.0070
2	-0.2498	.0689	.0332	.0214	.0047	2	-0.1022	.0783	.0126	.0079	.0066
4	-0.1151	.0628	.0407	.0057	.0047	4	.0550	.0783	.0246	-.0098	.0064
6	.0563	.0664	.0455	-.0143	.0048	6	.2613	.0910	.0232	-.0342	.0092
8	.02522	.0853	.0451	-.0367	.0083	8	.4381	.1399	-.0094	-.0560	.0135
10	.04236	.1164	.0144	-.0545	.0134	10	.5757	.1458	-.0330	-.0745	.0186
12	.5362	.1499	.0153	-.0656	.0181	12	.7132	.1839	-.0646	-.0902	.0249
16	.6684	.2152	.0503	-.0782	.0268	16	.9293	.2719	-.1137	-.1161	.0383
20	.7248	.2883	.0752	-.0845	.0358	20	.1238	.3913	-.1699	-.1406	.0560
$M = 0.90$						$M = 1.10$					
-4	-0.7168	.1283	.0379	.0755	.0098	-4	-0.5510	.1282	.0297	.0617	.0109
-2	-0.5501	.0987	.0298	.0560	.0071	-2	-0.4001	.1015	.0121	.0431	.0079
0	-0.3508	.0819	.0395	.0338	.0057	0	-0.2397	.0836	.0054	.0238	.0065
2	-0.2209	.0739	.0476	.0198	.0054	2	-0.0981	.0766	.0121	.0076	.0062
4	-0.0848	.0639	.0479	.0033	.0049	4	.0623	.0770	.0270	-.0110	.0061
6	.0871	.0685	.0565	-.0167	.0054	6	.2321	.0921	.0162	-.0328	.0088
8	.02933	.0867	.0536	-.0398	.0091	8	.4114	.1146	-.0115	-.0546	.0127
10	.04881	.1181	.0319	-.0624	.0143	10	.5529	.1447	-.0351	-.0724	.0174
12	.5614	.1500	.0111	-.0673	.0189	12	.6756	.1823	-.0593	-.0873	.0234
16	.7035	.2213	.0540	-.0820	.0285	16	.8832	.2659	-.1092	-.1115	.0364
20	.7746	.2944	.0848	-.0899	.0379	20	.0681	.3786	-.1598	-.1341	.0529

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 15° AND TAPER RATIO OF 1 - Continued

(c) Half-span spoiler slot deflector;  $\delta_s = -0.075c$ ;  $\delta_d/\delta_s = 0.75$ 

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
M = 0.60											
-4	-0.6085	0.1004	.0058	.0607	.0076	-4	-0.6290	.0703	.0306	.0664	.0111
-2	-0.4451	0.0823	.0065	.0437	.0056	-2	-0.4619	.0570	.0177	.0468	.0081
0	-0.3361	0.0760	.0130	.0306	-.0118	0	-0.2825	.0498	.0232	.0261	.0072
2	-0.2362	0.0733	.0227	.0185	.0043	2	-0.1237	.0467	.0306	.0108	.0069
4	-0.1272	0.0724	.0305	.0058	.0043	4	.0103	.0441	.0472	-.0065	.0067
6	.0182	0.0733	.0344	-.0106	.0048	6	.2165	.0477	.0520	-.0300	.0090
8	.1907	0.0950	.0383	-.0314	.0075	8	.3918	.0595	.0343	-.0516	.0124
10	.3542	0.1248	.0149	-.0493	.0124	10	.5176	.0734	.0140	-.0683	.0172
12	.4723	0.1574	.0110	-.0610	.0169	12	.6560	.1880	-.0184	-.0844	.0245
16	.5813	0.2198	.0415	-.0711	.0254	16	.8520	.2691	-.0590	-.1067	.0372
20	.6031	0.2768	.0571	-.0737	.0325	20	.9345	.3554	-.1076	-.1138	.0486
M = 0.80											
-4	-0.6359	0.1125	.0114	.0643	.0083	M = 1.00					
-2	-0.4493	0.0923	.0009	.0448	.0062	-4	-0.5752	.1393	.0246	.0621	.0112
0	-0.3142	0.0831	.0167	.0290	.0052	-2	-0.4235	.1128	.0088	.0440	.0084
2	-0.2087	0.0776	.0298	.0162	.0048	0	-0.2541	.0971	.0081	.0240	.0071
4	-0.0737	0.0746	.0408	.0011	.0050	2	-0.1103	.0902	.0204	.0094	.0067
6	.0859	0.0788	.0513	-.0166	.0056	4	.0591	.0883	.0359	-.0015	.0072
8	.2553	0.0978	.0496	-.0368	.0085	6	.2522	.0991	.0289	-.0332	.0098
10	.4149	0.1283	.0154	-.0532	.0138	8	.4038	.1216	.0046	-.0543	.0139
12	.4910	0.1595	.0031	-.0605	.0181	10	.5496	.1530	-.0225	-.0720	.0189
16	.5769	0.2170	.0290	-.0692	.0259	12	.6639	.1893	-.0458	-.0857	.0250
20	.6506	0.2848	.0557	-.0778	.0348	16	.8628	.2707	-.0855	-.1086	.0374
M = 0.85											
-4	-0.6776	0.1224	.0004	.0696	.0090	M = 1.05					
-2	-0.4709	0.0972	.0029	.0466	.0065	-4	-0.5637	.1366	.0264	.0620	.0112
0	-0.3078	0.0863	.0172	.0283	.0054	-2	-0.3972	.1083	.0095	.0418	.0078
2	-0.1975	0.0806	.0320	.0155	.0051	0	-0.2497	.0951	.0074	.0232	.0067
4	-0.0528	0.0766	.0443	-.0004	.0052	2	-0.1002	.0866	.0193	.0075	.0062
6	.1171	0.0812	.0566	-.0201	.0062	4	.0586	.0857	.0345	-.0105	.0066
8	.3124	0.1029	.0534	-.0431	.0101	6	.2478	.0998	.0230	-.0339	.0099
10	.4640	0.1321	.0341	-.0614	.0044	8	.4029	.1234	-.0007	-.0533	.0135
12	.5053	0.1607	.0004	-.0620	.0185	10	.5126	.1516	-.0233	-.0692	.0181
16	.6087	0.2236	.0291	-.0726	.0270	12	.6374	.1865	-.0456	-.0823	.0239
20	.6891	0.2893	.0624	-.0826	.0368	16	.8285	.2665	-.0835	-.1046	.0361
M = 0.90											
-4	-0.6510	0.1296	.0089	.0695	.0095	M = 1.10					
-2	-0.5100	0.1059	.0089	.0504	.0071	-4	-0.5475	.1281	.0264	.0598	.0105
0	-0.3147	0.0924	.0244	.0290	.0060	-2	-0.3924	.0591	.0101	.0423	.0075
2	-0.1845	0.0864	.0392	.0149	.0055	0	-0.2281	.0445	.0082	.0223	.0061
4	-0.0369	0.0789	.0516	-.0011	.0055	2	-0.0967	.0836	.0202	.0072	.0057
6	.1628	0.0870	.0613	-.0236	.0068	4	.0602	.0827	.0336	-.0105	.0061
8	.3581	.1091	.0485	-.0478	.0109	6	.2372	.0972	.0205	-.0331	.0083
10	.5100	0.1399	.0318	-.0663	.0158	8	.3832	.1218	-.0020	-.0522	.0117
12	.6076	0.1734	.0171	-.0784	.0212	10	.5055	.1490	-.0225	-.0670	.0153
16	.6510	0.2328	.0337	-.0754	.0283	12	.6205	.1863	-.0430	-.0803	.0200
20	.7487	0.3058	.0744	-.1063	.0389	16	.7847	.2671	-.0799	-.1169	.0300
						20	.9417	.3716	-.1233	-.1209	.0449

TABLE II. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 15° AND TAPER RATIO OF 1 - Concluded

(d) Half-span spoiler slot deflector;  $\delta_s = -0.075c$ ;  $\delta_d/\delta_s = 1.00$

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
<b>M = 0.60</b>											
-4	-0.5464	.1079	.0033	.0574	.0083	-4	-0.5727	.1400	.0059	.0621	.0108
-2	-0.3825	.0916	.0033	-.0388	.0067	-2	-0.4383	.1246	.0022	.0448	.0090
0	-0.2732	.0898	.0182	.0256	.0062	0	-0.2585	.1091	.0188	.0237	.0082
2	-0.1821	.0871	.0260	.0148	.0062	2	-0.1241	.1040	.0329	.0094	.0081
4	-0.0820	.0852	.0364	.0025	.0057	4	-0.0310	.1019	.0506	-.0078	.0080
6	.0455	.0871	.0443	-.0129	.0058	6	.2068	.1091	.0576	-.0290	.0095
8	.1730	.1052	.0508	-.0295	.0082	8	.3577	.1297	.0465	-.0487	.0132
10	.3370	.1351	.0351	-.0473	.0131	10	.5066	.1606	.0225	-.0671	.0187
12	.4462	.1678	.0117	-.0585	.0181	12	.6306	.2069	-.0089	-.0857	.0255
16	.5191	.2186	.0091	-.0653	.0253	16	.8167	.2841	-.0392	-.1048	.0373
20	.5464	.2757	.0208	-.0692	.0325	20	.7857	.3356	-.0598	-.0953	.0425
<b>M = 0.80</b>											
-4	-0.5539	.1201	.0167	.0594	.0084	<b>M = 1.00</b>					
-2	-0.3939	.1017	.0053	.0405	.0066	-4	-0.5726	.1563	.0243	.0622	.0124
0	-0.2585	.0956	.0128	.0247	.0060	-2	-0.4048	.1288	.0074	.0424	.0096
2	-0.1600	.0913	.0246	.0129	.0060	0	-0.2271	.1140	.0173	.0215	.0087
4	-0.0308	.0882	.0387	-.0021	.0060	2	-0.0987	.1072	.0310	.0069	.0085
6	.1046	.0938	.0510	.0192	.0066	4	.0296	.1072	.0445	-.0091	.0083
8	.2708	.1109	.0506	-.0373	.0098	6	.2271	.1190	.0445	-.0320	.0107
10	.4246	.1434	.0246	-.0546	.0150	8	.3850	.1406	.0215	-.0522	.0146
12	.4862	.1691	.0075	-.0611	.0189	10	.5233	.1701	-.0039	-.0700	.0197
16	.5329	.2212	.0048	-.0658	.0255	12	.6417	.2055	-.0254	-.0839	.0253
20	.5846	.2825	.0194	-.0725	.0337	16	.8195	.2841	-.0550	-.1045	.0370
<b>M = 0.85</b>											
-4	-0.5992	.1268	.0119	.0633	.0091	<b>M = 1.05</b>					
-2	-0.4148	.1067	.0078	.0422	.0072	-4	-0.5498	.1567	.0241	.0604	.0119
0	-0.2650	.0970	.0181	.0249	.0063	-2	-0.3981	.1331	.0098	.0416	.0092
2	-0.1544	.0912	.0276	.0118	.0063	0	-0.2370	.1170	.0142	.0218	.0081
4	-0.0230	.0895	.0424	-.0030	.0062	2	-0.0948	.1095	.0291	.0067	.0075
6	.1268	.0952	.0552	-.0207	.0072	4	.0569	.1095	.0444	-.0112	.0078
8	.3111	.1153	.0560	-.0426	.0108	6	.2370	.1237	.0369	-.0331	.0104
10	.4494	.1440	.0354	-.0586	.0154	8	.3887	.1473	.0146	-.0526	.0143
12	.5185	.1756	.0099	-.0639	.0200	10	.5024	.1727	-.0081	-.0672	.0189
16	.5531	.2272	.0049	-.0679	.0264	12	.6162	.2039	-.0268	-.0808	.0243
20	.6153	.2914	.0247	-.0758	.0354	16	.7868	.2841	-.0589	-.1020	.0355
<b>M = 0.90</b>											
-4	-0.5986	.1311	.0043	.0654	.0099	<b>M = 1.10</b>					
-2	-0.4244	.1095	.0016	.0436	.0080	-4	-0.5305	.1494	.0265	.0587	.0112
0	-0.2721	.1019	.0171	.0252	.0070	-2	-0.3841	.1239	.0101	.0409	.0085
2	-0.1415	.0932	.0319	.0114	.0070	0	-0.2286	.1084	.0124	.0213	.0074
4	-0.0109	.0910	.0494	-.0045	.0066	2	-0.0915	.1056	.0271	.0060	.0071
6	.1632	.0964	.0611	-.0240	.0078	4	.0640	.1056	.0428	-.0119	.0071
8	.3591	.1181	.0533	-.0477	.0120	6	.2378	.1239	.0330	-.0327	.0093
10	.4897	.1474	.0385	-.0650	.0164	8	.3750	.1448	.0127	-.0515	.0125
12	.5942	.1799	.0264	-.0762	.0219	10	.4847	.1721	-.0075	-.0656	.0167
16	.5877	.2341	.0070	-.0706	.0278	12	.5853	.2040	-.0258	-.0780	.0209
20	.6530	.2991	.0327	-.0800	.0368	16	.7591	.2860	-.0497	-.0984	.0305

TABLE III.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 30° AND TAPER RATIO OF 0

## (a) Plain wing

$\alpha$ , deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$		$c_L$	$c_D$	$c_m$	$c_l$	$c_n$
$M = 0.60$											
$M = 0.95$											
-4	-.3283	.0173	.0068	.0322	.0018		-.4657	.0440	.0669	.0472	.0026
-2	-.2244	.0154	.0049	.0219	.0007		-.2744	.0212	.0432	.0294	.0009
0	-.0821	.0163	.0024	.0072	.0003		-.0852	.0129	.0145	.0085	-.0001
2	.0347	.0218	.0034	-.0053	.0003		.0936	.0135	-.0128	-.0107	.0004
4	.1532	.0282	.0161	-.0172	.0007		.2807	.0233	-.0440	-.0303	.0032
6	.2846	.0509	.0181	-.0297	.0040		.4553	.0471	-.0705	-.0481	.0067
8	.4013	.0826	.0112	-.0390	.0083		.6174	.0828	-.0905	-.0623	.0108
10	.5016	.1199	.0200	-.0465	.0117		.7255	.1242	-.0989	-.0712	.0146
12	.5874	.1580	.0244	-.0515	.0153		.8191	.1682	-.1059	-.0721	.0184
16	.6859	.2316	.0416	-.0572	.0208		.9126	.2562	-.1254	-.0783	.0255
20	.7625	.3161	.0680	-.0606	.0267		.9750	.3467	-.1488	-.0801	.0322
$M = 0.80$											
$M = 1.00$											
-4	-.3646	.0221	.0149	.0352	.0021		-.4195	.0520	.0741	.0434	-.0001
-2	-.2353	.0123	.0119	.0232	.0005		-.2405	.0277	.0426	.0264	.0002
0	-.0813	.0098	.0040	.0080	.0000		-.0417	.0173	.0107	.0051	-.0005
2	.0653	.0135	.0066	-.0074	.0000		.0974	.0223	-.0165	-.0102	.0005
4	.2082	.0251	.0129	-.0211	.0027		.2664	.0312	-.0453	-.0281	.0030
6	.3498	.0454	.0162	-.0342	.0050		.4354	.0544	-.0746	-.0460	.0058
8	.4668	.0767	.0218	-.0439	.0083		.6043	.0916	-.1092	-.0616	.0104
10	.5716	.1135	.0300	-.0511	.0116		.7534	.1351	-.1385	-.0749	.0152
12	.6405	.1503	.0399	-.0551	.0147		.8826	.1905	-.1652	-.0426	.0208
16	.7415	.2257	.0634	-.0608	.0205		.1013	.3058	-.1998	-.0494	.0312
20	.8056	.3042	.0941	-.0643	.0264		.2285	.4256	-.2158	-.0519	.0417
$M = 0.85$											
$M = 1.05$											
-4	-.3821	.0247	.0198	.0376	.0023		-.4051	.0557	.0717	.0407	.0007
-2	-.2390	.0121	.0139	.0247	.0006		-.2274	.0352	.0430	.0236	.0002
0	-.0843	.0086	.0046	.0085	.0000		-.0420	.0271	.0092	.0046	-.0006
2	.0797	.0109	.0068	-.0089	.0001		.0917	.0295	-.0154	-.0093	.0000
4	.2240	.0207	.0152	-.0227	.0025		.2542	.0400	-.0461	-.0265	.0023
6	.3717	.0448	.0170	-.0362	.0053		.4166	.0628	-.0768	-.0437	.0051
8	.4953	.0730	.0294	-.0459	.0088		.5791	.0971	-.1060	-.0584	.0090
10	.5934	.1092	.0377	-.0534	.0120		.7128	.1399	-.1357	-.0715	.0140
12	.6742	.1506	.0483	-.0573	.0153		.8562	.1922	-.1598	-.0828	.0196
16	.7712	.2242	.0764	-.0633	.0210		.0434	.2988	-.1946	-.0952	.0293
20	.8381	.3104	.1098	-.0676	.0278		.1887	.4301	-.2136	-.1064	.0420
$M = 0.90$											
$M = 1.10$											
-4	-.4287	.0310	.0360	.0421	.0024		-.3725	.0441	.0682	.0384	.0020
-2	-.2625	.0152	.0220	.0272	.0006		-.2157	.0271	.0371	.0226	.0002
0	-.0809	.0087	.0088	.0084	.0000		-.0498	.0216	.0049	.0046	-.0007
2	.0919	.0109	.0062	-.0097	.0004		.0940	.0225	-.0183	-.0098	.0000
4	.2493	.0218	.0193	-.0262	.0029		.2268	.0386	-.0450	-.0248	.0018
6	.4352	.0414	.0337	-.0431	.0062		.4112	.0638	-.0741	-.0422	.0047
8	.5337	.0762	.0469	-.0515	.0097		.5495	.0959	-.1038	-.0557	.0086
10	.6386	.1143	.0574	-.0581	.0132		.6970	.1395	-.1310	-.0690	.0136
12	.7239	.1552	.0703	-.0631	.0168		.8261	.1923	-.1557	-.0796	.0190
16	.8071	.2314	.0923	-.0674	.0226		.0068	.3002	-.1878	-.0916	.0290
20	.8945	.3212	.1301	-.0730	.0301		.1174	.4214	-.2001	-.1023	.0411

TABLE III. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 30° AND TAPER RATIO OF 0 - Continued

(b) Half-span spoiler slot deflector;  $\delta_s = -0.075c$ ;  $\delta_d/\delta_s = 0.50$

$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
M = 0.60						M = 0.95					
-4	-0.6333	0.1225	0.0408	0.0528	0.0091	-4	-0.6927	0.1589	0.1041	0.0631	0.0093
-2	-0.5507	0.1042	0.0433	0.0456	0.0065	-2	-0.5668	0.1296	0.0830	0.0500	0.0067
0	-0.4314	0.0932	0.0448	0.0357	0.0045	0	-0.3989	0.1118	0.0689	0.0322	0.0050
2	-0.3213	0.0896	0.0408	0.0234	0.0039	2	-0.2729	0.1014	0.0549	0.0191	0.0044
4	-0.2203	0.0905	0.0310	0.0113	0.0040	4	-0.1469	0.0962	0.0436	0.0065	0.0045
6	-0.0734	0.0923	0.0187	-0.0022	0.0045	6	-0.0105	0.0982	0.0380	-0.0088	0.0055
8	0.0698	0.1088	0.0103	-0.0154	0.0064	8	0.1679	0.1139	0.0183	-0.0246	0.0079
10	0.2019	0.1408	0.0039	-0.0259	0.0096	10	0.3149	0.1432	0.0028	-0.0372	0.0162
12	0.3176	0.1773	0.0039	-0.0324	0.0126	12	0.4513	0.1714	-0.0155	-0.0466	0.0149
16	0.5048	0.2440	0.0108	-0.0446	0.0193	16	0.6823	0.2498	-0.0549	-0.0609	0.0222
20	0.6333	0.3199	0.0290	-0.0503	0.0582	20	0.8292	0.3439	-0.0914	-0.0681	0.0296
M = 0.80						M = 1.00					
-4	-0.6940	0.1475	0.0807	0.0586	0.0093	-4	-0.5926	0.1570	0.0659	0.0556	0.0089
-2	-0.6196	0.1228	0.0840	0.0509	0.0067	-2	-0.4620	0.1340	0.0498	0.0428	0.0066
0	-0.4957	0.1074	0.0840	0.0395	0.0040	0	-0.3314	0.1140	0.0390	0.0286	0.0051
2	-0.3767	0.0969	0.0757	0.0276	0.0040	2	-0.2109	0.1040	0.0256	0.0148	0.0045
4	-0.2478	0.0913	0.0608	0.0159	0.0038	4	-0.0402	0.1040	0.0067	-0.0007	0.0050
6	-0.0917	0.0919	0.0492	-0.0006	0.0044	6	0.0904	0.1070	0.0027	-0.0151	0.0060
8	0.0867	0.1074	0.0309	-0.0159	0.0068	8	0.2712	0.1340	-0.0202	-0.0318	0.0093
10	0.2107	0.1351	0.0176	-0.0263	0.0099	10	0.3576	0.1470	-0.0283	-0.0411	0.0121
12	0.3594	0.1678	0.0076	-0.0359	0.0131	12	0.5223	0.1920	-0.0525	-0.0537	0.0165
16	0.5577	0.2369	0.0149	-0.0480	0.0191	16	0.7533	0.1740	-0.0942	-0.0702	0.0252
20	0.6890	0.3073	0.0455	-0.0554	0.0255	20	0.9341	0.3890	-0.1427	-0.0824	0.0355
M = 0.85						M = 1.05					
-4	-0.7252	0.1551	0.1100	0.0611	0.0088	-4	-0.5892	0.1481	0.0585	0.0546	0.0087
-2	-0.6043	0.1238	0.0913	0.0510	0.0065	-2	-0.4540	0.1260	0.0430	0.0417	0.0065
0	-0.4881	0.1088	0.0881	0.0394	0.0047	0	-0.2994	0.1096	0.0280	0.0263	0.0051
2	-0.3719	0.0972	0.0819	0.0279	0.0040	2	-0.1777	0.1000	0.0119	0.0132	0.0047
4	-0.2371	0.0891	0.0657	0.0135	0.0039	4	-0.0483	0.1000	0.0016	-0.0008	0.0049
6	-0.0930	0.0914	0.0570	-0.0008	0.0046	6	0.1217	0.1068	-0.0088	-0.0169	0.0062
8	0.0697	0.1088	0.0399	-0.0149	0.0070	8	0.2646	0.1289	-0.0243	-0.0318	0.0091
10	0.2208	0.1296	0.0212	-0.0269	0.0100	10	0.4153	0.1577	-0.0476	-0.0448	0.0129
12	0.3789	0.1643	0.0072	-0.0378	0.0136	12	0.5602	0.1962	-0.0683	-0.0559	0.0169
16	0.5811	0.2303	0.0215	-0.0502	0.0198	16	0.7630	0.2799	-0.1066	-0.0715	0.0256
20	0.7089	0.3148	0.0558	-0.0575	0.0263	20	0.9388	0.3934	-0.1563	-0.0854	0.0364
M = 0.90						M = 1.10					
-4	-0.7386	0.1581	0.1064	0.0653	0.0076	-4	-0.5498	0.1429	0.0564	0.0519	0.0080
-2	-0.6063	0.1306	0.0960	0.0521	0.0058	-2	-0.4380	0.1225	0.0415	0.0399	0.0061
0	-0.4674	0.1120	0.0907	0.0379	0.0047	0	-0.3075	0.1058	0.0265	0.0271	0.0049
2	-0.3417	0.0999	0.0798	0.0249	0.0041	2	-0.1677	0.0965	0.0105	0.0123	0.0045
4	-0.2095	0.0922	0.0665	0.0106	0.0039	4	-0.0373	0.0937	0.0005	-0.0014	0.0051
6	-0.0595	0.0922	0.0582	-0.0036	0.0048	6	0.1212	0.1012	-0.0105	-0.0172	0.0062
8	0.0992	0.1065	0.0414	-0.0177	0.0069	8	0.2609	0.1243	-0.0260	-0.0319	0.0092
10	0.2646	0.1361	0.0236	-0.0308	0.0101	10	0.4194	0.1568	-0.0485	-0.0444	0.0129
12	0.4189	0.1614	0.0030	-0.0413	0.0136	12	0.5405	0.1939	-0.0659	-0.0539	0.0167
16	0.6394	0.2382	0.0363	-0.0563	0.0207	16	0.7269	0.2710	-0.1009	-0.0683	0.0247
20	0.7607	0.3172	0.0709	-0.0631	0.0273	20	0.9133	0.3888	-0.1459	-0.0827	0.0358

TABLE III. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 30° AND TAPER RATIO OF 0 - Continued

(c) Half-span spoiler slot deflector;  $\delta_s = -0.075c$ ;  $\delta_d/\delta_s = 0.75$ 

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
M = 0.60											M = 0.95
-4	-0.6608	0.1448	0.0784	0.0553	0.0093	-4	-0.7025	0.1827	0.1107	0.0629	0.0106
-2	-0.5798	0.1246	0.0849	0.0487	0.0071	-2	-0.5557	0.1556	0.0925	0.0485	0.0081
0	-0.4786	0.1127	0.0923	0.0389	0.0054	0	-0.4089	0.1389	0.0860	0.0321	0.0065
2	-0.3958	0.1081	0.0923	0.0299	0.0050	2	-0.3083	0.1316	0.0770	0.0210	0.0059
4	-0.2945	0.1036	0.0858	0.0181	0.0047	4	-0.1783	0.1211	0.0680	0.0074	0.0058
6	-0.1657	0.1063	0.0784	0.0055	0.0050	6	-0.0419	0.1232	0.0615	-0.0072	0.0067
8	-0.0276	0.1219	0.0710	-0.0079	0.0062	8	0.1258	0.1389	0.0475	-0.0212	0.0092
10	0.1012	0.1448	0.0612	-0.0181	0.0087	10	0.2831	0.1671	0.0298	-0.0341	0.0136
12	0.2117	0.1723	0.0587	-0.0244	0.0111	12	0.3712	0.1911	0.0194	-0.0413	0.0153
16	0.4142	0.2419	0.0419	-0.0377	0.0172	16	0.5662	0.2537	-0.0045	-0.0521	0.0213
20	0.5559	0.3153	0.0094	-0.0441	0.0227	20	0.7025	0.3320	-0.0410	-0.0598	0.0282
M = 0.80											M = 1.00
-4	-0.6586	0.1565	0.0796	0.0555	0.0093	-4	-0.6417	0.1787	0.0924	0.0596	0.0106
-2	-0.5467	0.1318	0.0806	0.0468	0.0182	-2	-0.5013	0.1538	0.0723	0.0446	0.0079
0	-0.4349	0.1194	0.0686	0.0355	0.0051	0	-0.3449	0.1398	0.0548	0.0275	0.0064
2	-0.3579	0.1132	0.0889	0.0257	0.0045	2	-0.2005	0.1308	0.0398	0.0143	0.0060
4	-0.2535	0.1064	0.0863	0.0143	0.0045	4	-0.1003	0.1268	0.0344	0.0026	0.0061
6	-0.1367	0.1070	0.0839	0.0023	0.0051	6	0.0501	0.1328	0.0236	-0.0137	0.0071
8	0.0000	0.1213	0.0806	-0.0079	0.0069	8	0.2206	0.1528	0.0075	-0.0283	0.0100
10	0.1168	0.1441	0.0773	-0.0192	0.0092	10	0.3569	0.1847	-0.0107	-0.0407	0.0136
12	0.2485	0.1689	0.0646	-0.0277	0.0119	12	0.4713	0.2097	-0.0220	-0.0500	0.0172
16	0.4349	0.2308	0.0380	-0.0389	0.0173	16	0.6417	0.2776	-0.0355	-0.0601	0.0234
20	0.5840	0.3031	0.0193	-0.0477	0.0236	20	0.8422	0.3894	-0.0946	-0.0756	0.0342
M = 0.85											M = 1.05
-4	-0.6710	0.1589	0.0809	0.0589	0.0099	-4	-0.5880	0.1747	0.0734	0.0553	0.0100
-2	-0.5522	0.1322	0.0793	0.0477	0.0072	-2	-0.4665	0.1516	0.0589	0.0424	0.0075
0	-0.4287	0.1177	0.0840	0.0349	0.0053	0	-0.3181	0.1373	0.0424	0.0264	0.0062
2	-0.3378	0.1131	0.0849	0.0253	0.0050	2	-0.1928	0.1277	0.0294	0.0132	0.0055
4	-0.2330	0.1056	0.0824	0.0130	0.0051	4	-0.0771	0.1267	0.0227	0.0008	0.0059
6	-0.1095	0.1067	0.0824	0.0008	0.0054	6	0.0771	0.1325	0.0114	-0.0149	0.0070
8	0.0233	0.1206	0.0793	-0.0118	0.0075	8	0.2410	0.1536	-0.0021	-0.0297	0.0101
10	0.1514	0.1438	0.0731	-0.0209	0.0098	10	0.3836	0.1804	-0.0212	-0.0421	0.0139
12	0.2679	0.1676	0.0653	-0.0289	0.0122	12	0.4916	0.2140	-0.0341	-0.0512	0.0176
16	0.4613	0.2337	0.0325	-0.0409	0.0181	16	0.6747	0.2908	-0.0651	-0.0654	0.0254
20	0.6058	0.3051	0.0087	-0.0499	0.0245	20	0.8482	0.3916	-0.1054	-0.0776	0.0351
M = 0.90											M = 1.10
-4	-0.6947	0.1647	0.0943	0.0599	0.0101	-4	-0.5766	0.1695	0.0723	0.0546	0.0092
-2	-0.5624	0.1406	0.0869	0.0485	0.0073	-2	-0.4501	0.1463	0.0568	0.0409	0.0068
0	-0.4323	0.1252	0.0869	0.0349	0.0058	0	-0.3162	0.1324	0.0409	0.0263	0.0056
2	-0.3374	0.1186	0.0845	0.0236	0.0055	2	-0.1804	0.1204	0.0259	0.0124	0.0054
4	-0.2183	0.1131	0.0819	0.0110	0.0054	4	-0.0651	0.1195	0.0194	0.0000	0.0059
6	-0.0926	0.1131	0.0795	-0.0019	0.0060	6	0.0837	0.1278	0.0095	-0.0154	0.0070
8	0.0551	0.1285	0.0736	-0.0159	0.0081	8	0.2418	0.1510	-0.0030	-0.0296	0.0098
10	0.1875	0.1493	0.0641	-0.0251	0.0106	10	0.3627	0.1834	-0.0254	-0.0417	0.0137
12	0.3022	0.1735	0.0544	-0.0331	0.0133	12	0.4966	0.2186	-0.0404	-0.0514	0.0175
16	0.4962	0.2394	0.0213	-0.0453	0.0191	16	0.6510	0.2871	-0.0653	-0.0634	0.0246
20	0.6396	0.3163	0.0225	-0.0540	0.0260	20	0.8184	0.3982	-0.1067	-0.0757	0.0342

TABLE III. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 30° AND TAPER RATIO OF 0 - Concluded

(d) Half-span spoiler slot deflector;  $\delta_S = -0.075c$ ;  $\delta_d/\delta_S = 1.00$

$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$											
-4	-0.4980	.1350	.0608	.0434	.0076	-4	-0.5462	.1673	.0611	.0507	.0086
-2	-0.4242	.1240	.0554	.0365	.0064	-2	-0.4306	.1537	.0569	.0372	.0072
0	-0.3338	.1231	.0662	.0264	.0051	0	-0.3151	.1475	.0569	.0246	.0062
2	-0.2674	.1221	.0653	.0185	.0051	2	-0.2101	.1360	.0538	.0130	.0059
4	-0.1844	.1194	.0732	.0092	.0047	4	-0.1113	.1412	.0518	.0020	.0062
6	-0.0922	.1304	.0751	-.0002	.0047	6	.0210	.1464	.0487	-.0115	.0071
8	.0000	.1414	.0766	-.0092	.0059	8	.1512	.1652	.0431	-.0239	.0093
10	.0830	.1607	.0806	-.0164	.0078	10	.2836	.1945	.0352	-.0347	.0129
12	.1660	.1892	.0914	-.0212	.0096	12	.3886	.2249	.0301	-.0425	.0159
16	.2951	.2397	.0934	-.0292	.0138	16	.5042	.2688	.0287	-.0473	.0202
20	.4298	.3021	.0677	-.0355	.0182	20	.6386	.3451	.0048	-.0554	.0267
$M = 0.80$											
-4	-0.5167	.1581	.0507	.0452	.0078	$M = 1.00$					
-2	-0.4221	.1407	.0534	.0359	.0058	-4	-0.5524	.2850	.0729	.0513	.0097
0	-0.3200	.1333	.0584	.0254	.0049	-2	-0.4118	.1680	.0611	.0361	.0077
2	-0.2303	.1302	.0577	.0151	.0048	0	-0.2913	.1620	.0536	.0227	.0070
4	-0.1332	.1265	.0574	.0049	.0050	2	-0.2009	.1550	.0450	.0124	.0069
6	-0.0311	.1314	.0574	-.0062	.0053	4	-0.0803	.1530	.0412	-.0003	.0068
8	.0872	.1488	.0607	-.0161	.0074	6	.0402	.1570	.0396	-.0131	.0074
10	.1805	.1705	.0644	-.0232	.0097	8	.2109	.1820	.0213	-.0289	.0102
12	.2615	.1934	.0717	-.0286	.0118	10	.3314	.2070	.0113	-.0392	.0139
16	.3797	.2418	.0751	-.0337	.0157	12	.4419	.2350	.0019	-.0478	.0174
20	.4669	.2976	.0597	-.0387	.0205	16	.5926	.2950	-.0070	-.0578	.0231
$M = 0.85$											
-4	-0.5195	.1569	.0522	.0452	.0080	$M = 1.05$					
-2	-0.4144	.1395	.0485	.0354	.0063	-4	-0.5349	.1856	.0668	.0499	.0095
0	-0.3070	.1337	.0526	.0244	.0051	-2	-0.3959	.1682	.0520	.0351	.0078
2	-0.2218	.1279	.0516	.0147	.0051	0	-0.2703	.1586	.0432	.0215	.0069
4	-0.1167	.1250	.0497	.0032	.0052	2	-0.1603	.1519	.0349	.0099	.0057
6	-0.0058	.1331	.0538	-.0083	.0059	4	-0.0579	.1519	.0305	-.0017	.0068
8	.1051	.1494	.0560	-.0180	.0078	6	.0869	.1625	.0176	-.0170	.0079
10	.1984	.1709	.0585	-.0254	.0102	8	.2317	.1807	.0070	-.0303	.0104
12	.2918	.1947	.0641	-.0313	.0127	10	.3592	.2115	-.0085	-.0417	.0142
16	.4144	.2511	.0663	-.0370	.0167	12	.4789	.2423	-.0228	-.0511	.0179
20	.5019	.3057	.0491	-.0420	.0219	16	.6488	.3096	-.0448	-.0638	.0249
$M = 0.90$											
-4	-0.5249	.1595	.0539	.0477	.0082	$M = 1.10$					
-2	-0.4166	.1430	.0480	.0363	.0066	-4	-0.5253	.1771	.0617	.0485	.0091
0	-0.2984	.1364	.0524	.0246	.0056	-2	-0.4005	.1595	.0492	.0351	.0072
2	-0.2044	.1320	.0495	.0136	.0056	0	-0.2608	.1530	.0404	.0204	.0066
4	-0.1050	.1276	.0471	.0021	.0057	2	-0.1583	.1465	.0307	.0091	.0064
6	.0144	.1375	.0489	-.0100	.0063	4	-0.0466	.1437	.0237	-.0029	.0066
8	.1326	.1562	.0480	-.0212	.0087	6	.0838	.1549	.0130	-.0172	.0077
10	.2486	.1816	.0506	-.0303	.0113	8	.2421	.1808	.0030	-.0305	.0104
12	.3348	.2047	.0542	-.0360	.0139	10	.3632	.2059	-.0132	-.0411	.0141
16	.4531	.2641	.0509	-.0420	.0186	12	.4657	.2411	-.0282	-.0499	.0174
20	.5525	.3191	.0358	-.0467	.0235	16	.6426	.3060	-.0457	-.0627	.0245
$M = 1.10$											
-4	-0.5253	.1771	.0617	.0485	.0091	20	.7637	.4034	-.0696	-.0716	.0323
-2	-0.4005	.1595	.0492	.0351	.0072						
0	-0.2608	.1530	.0404	.0204	.0066						
2	-0.1583	.1465	.0307	.0091	.0064						
4	-0.0466	.1437	.0237	-.0029	.0066						
6	.0838	.1549	.0130	-.0172	.0077						
8	.2421	.1808	.0030	-.0305	.0104						
10	.3632	.2059	-.0132	-.0411	.0141						
12	.4657	.2411	-.0282	-.0499	.0174						
16	.6426	.3060	-.0457	-.0627	.0245						
20	.7637	.4034	-.0696	-.0716	.0323						

TABLE IV.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 30° AND TAPER RATIO OF 1

## (a) Plain wing

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$											
-4	-0.2984	0.0226	0.0104	0.0347	0.0023	-4	-0.3617	0.0370	0.0162	0.0427	0.0022
-2	-0.1874	0.0145	0.0065	0.0215	0.0022	-2	-0.1963	0.0206	0.0137	0.0244	0.0012
0	-0.0546	0.0091	0.0013	0.0059	0.0012	0	-0.0351	0.0103	0.0151	0.0046	0.0009
2	0.0819	0.0136	0.0046	-0.0097	0.0008	2	0.1240	0.0123	0.0089	-0.0136	0.0014
4	0.1965	0.0217	0.0150	-0.0237	0.0017	4	0.2687	0.0206	0.0107	-0.0313	0.0028
6	0.3275	0.0362	0.0280	-0.0393	0.0042	6	0.4237	0.0391	-0.0066	-0.0508	0.0057
8	0.4730	0.0652	0.0273	-0.0548	0.0083	8	0.5787	0.0669	-0.0288	-0.0694	0.0099
10	0.5913	0.1024	0.0104	-0.0673	0.0136	10	0.6945	0.0978	-0.0454	-0.0844	0.0151
12	0.6768	0.1449	0.0052	-0.0743	0.0190	12	0.8081	0.1410	-0.0657	-0.0980	0.0215
16	0.7241	0.2083	0.0013	-0.0754	0.0254	16	0.8784	0.2161	-0.0565	-0.1016	0.0297
20	0.7405	0.2718	0.0195	-0.0782	0.0324	20	0.8991	0.2943	-0.0620	-0.0998	0.0381
$M = 0.80$											
-4	-0.3346	0.0257	0.0167	0.0393	0.0022	-4	-0.3355	0.0393	-0.0021	0.0414	0.0032
-2	-0.1845	0.0141	0.0044	0.0219	0.0017	-2	-0.1816	0.0226	-0.0169	0.0225	0.0021
0	-0.0431	0.0086	0.0040	0.0056	0.0009	0	-0.0197	0.0147	0.0071	0.0035	0.0014
2	0.0972	0.0104	0.0123	-0.0107	0.0006	2	0.1145	0.0147	-0.0011	-0.0130	0.0018
4	0.2251	0.0184	0.0207	-0.0260	0.0021	4	0.2566	0.0265	-0.0116	-0.0308	0.0036
6	0.3752	0.0337	0.0338	-0.0434	0.0039	6	0.4046	0.0413	-0.0247	-0.0494	0.0062
8	0.5167	0.0625	0.0237	-0.0594	0.0082	8	0.5467	0.0678	-0.0494	-0.0679	0.0105
10	0.6151	0.0980	0.0044	-0.0695	0.0132	10	0.6711	0.0983	-0.0716	-0.0832	0.0156
12	0.6791	0.1347	0.0000	-0.0742	0.0174	12	0.7895	0.1366	-0.0892	-0.0977	0.0212
16	0.7307	0.1978	0.0048	-0.0773	0.0243	16	0.9672	0.2191	-0.1210	-0.1190	0.0332
20	0.7504	0.2634	0.0246	-0.0803	0.0319	20	0.8856	0.3194	-0.1368	-0.1308	0.0460
$M = 0.85$											
-4	-0.3502	0.0275	0.0148	0.0400	0.0021	-4	-0.3276	0.0396	0.0342	0.0402	0.0035
-2	-0.2073	0.0155	0.0074	0.0233	0.0016	-2	-0.1799	0.0245	0.0189	0.0224	0.0022
0	-0.0461	0.0086	0.0366	0.0055	0.0005	0	-0.0284	0.0189	0.0074	0.0037	0.0015
2	0.1037	0.0115	0.0148	-0.0118	0.0006	2	0.1136	0.0189	0.0000	-0.0125	0.0022
4	0.2350	0.0178	0.0235	-0.0280	0.0021	4	0.2462	0.0264	-0.0112	-0.0295	0.0037
6	0.4009	0.0333	0.0346	-0.0468	0.0045	6	0.3882	0.0405	-0.0284	-0.0477	0.0063
8	0.5552	0.0602	0.0329	-0.0655	0.0084	8	0.5208	0.0641	-0.0470	-0.0652	0.0099
10	0.6520	0.0946	0.0082	-0.0754	0.0139	10	0.6439	0.0943	-0.0670	-0.0798	0.0234
12	0.6911	0.1325	0.0033	-0.0752	0.0181	12	0.7518	0.1282	-0.0856	-0.0921	0.0202
16	0.7487	0.1984	0.0140	-0.0793	0.0254	16	0.9166	0.2055	-0.1177	-0.1135	0.0316
20	0.7764	0.2696	0.0280	-0.0823	0.0332	20	0.0794	0.3064	-0.1042	-0.1304	0.0459
$M = 0.90$											
-4	-0.3700	0.0325	0.0093	0.0425	0.0020	-4	-0.3200	0.0373	0.0330	0.0396	0.0033
-2	-0.2089	0.0168	0.0070	0.0239	0.0014	-2	-0.1737	0.0228	0.0193	0.0216	0.0020
0	-0.0479	0.0081	0.0043	0.0052	0.0005	0	-0.0256	0.0173	0.0078	0.0033	0.0013
2	0.1088	0.0108	0.0171	-0.0125	0.0010	2	0.1097	0.0182	0.0007	-0.0128	0.0021
4	0.2612	0.0179	0.0241	-0.0302	0.0025	4	0.2377	0.0246	-0.0091	-0.0288	0.0038
6	0.4244	0.0352	0.0233	-0.0507	0.0050	6	0.3840	0.0410	-0.0265	-0.0465	0.0061
8	0.5877	0.0629	0.0124	-0.0693	0.0090	8	0.5120	0.0628	-0.0464	-0.0629	0.0096
10	0.7183	0.0975	0.0117	-0.0852	0.0144	10	0.6217	0.0892	-0.0647	-0.0770	0.0142
12	0.7618	0.1371	0.0128	-0.0852	0.0197	12	0.7369	0.1247	-0.0827	-0.0899	0.0195
16	0.7770	0.2032	0.0226	-0.0842	0.0263	16	0.8996	0.2021	-0.1130	-0.1102	0.0305
20	0.8162	0.2763	0.0401	-0.0874	0.0346	20	0.0423	0.2986	-0.1398	-0.1275	0.0221
$M = 1.00$											
-4	-0.3355	0.0393	-0.0021	0.0414	0.0032	-4	-0.3355	0.0393	-0.0021	0.0414	0.0032
-2	-0.1816	0.0226	-0.0169	0.0225	0.0021	-2	-0.1816	0.0226	-0.0169	0.0225	0.0021
0	-0.0197	0.0147	0.0071	0.0035	0.0014	0	-0.0197	0.0147	0.0071	0.0035	0.0014
2	0.1145	0.0147	-0.0011	-0.0130	0.0018	2	0.1145	0.0147	-0.0011	-0.0130	0.0018
4	0.2566	0.0265	-0.0116	-0.0308	0.0036	4	0.2566	0.0265	-0.0116	-0.0308	0.0036
6	0.4046	0.0413	-0.0247	-0.0494	0.0062	6	0.4046	0.0413	-0.0247	-0.0494	0.0062
8	0.5467	0.0678	-0.0494	-0.0679	0.0105	8	0.5467	0.0678	-0.0494	-0.0679	0.0105
10	0.6711	0.0983	-0.0716	-0.0832	0.0156	10	0.6711	0.0983	-0.0716	-0.0832	0.0156
12	0.7895	0.1366	-0.0892	-0.0977	0.0212	12	0.7895	0.1366	-0.0892	-0.0977	0.0212
16	0.9672	0.2191	-0.1210	-0.1190	0.0332	16	0.9672	0.2191	-0.1210	-0.1190	0.0332
20	0.8856	0.3194	-0.1368	-0.1308	0.0460	20	0.8856	0.3194	-0.1368	-0.1308	0.0460
$M = 1.05$											
-4	-0.3276	0.0396	0.0342	0.0402	0.0035	-4	-0.3276	0.0396	0.0342	0.0402	0.0035
-2	-0.1799	0.0245	0.0189	0.0224	0.0022	-2	-0.1799	0.0245	0.0189	0.0224	0.0022
0	-0.0284	0.0189	0.0074	0.0037	0.0015	0	-0.0284	0.0189	0.0074	0.0037	0.0015
2	0.1136	0.0189	0.0000	-0.0125	0.0022	2	0.1136	0.0189	0.0000	-0.0125	0.0022
4	0.2462	0.0264	-0.0112	-0.0295	0.0037	4	0.2462	0.0264	-0.0112	-0.0295	0.0037
6	0.3882	0.0405	-0.0284	-0.0477	0.0063	6	0.3882	0.0405	-0.0284	-0.0477	0.0063
8	0.5208	0.0641	-0.0470	-0.0652	0.0099	8	0.5208	0.0641	-0.0470	-0.0652	0.0099
10	0.6439	0.0943	-0.0670	-0.0798	0.0234	10	0.6439	0.0943	-0.0670	-0.0798	0.0234
12	0.7518	0.1282	-0.0856	-0.0921	0.0202	12	0.7518	0.1282	-0.0856	-0.0921	0.0202
16	0.9166	0.2055	-0.1177	-0.1135	0.0316	16	0.9166	0.2055	-0.1177	-0.1135	0.0316
20	0.0794	0.3064	-0.1042	-0.1304	0.0459	20	0.0794	0.3064	-0.1042	-0.1304	0.0459
$M = 1.10$											
-4	-0.3200	0.0373	0.0330	0.0396	0.0033	-4	-0.3200	0.0373	0.0330	0.0396	0.0033
-2	-0.1737	0.0228	0.0193	0.0216	0.0020	-2	-0.1737	0.0228	0.0193	0.0216	0.0020
0	-0.0256	0.0173	0.0078	0.0033	0.0013	0	-0.0256	0.0173	0.0078	0.0033	0.0013
2	0.1097	0.0182	0.0007	-0.0128	0.0021	2	0.1097	0.0182	0.0007	-0.0128	0.0021
4	0.2377	0.0246	-0.0091	-0.0288	0.0038	4	0.2377	0.0246	-0.0091	-0.0288	0.0038
6	0.3840	0.0410	-0.0265	-0.0465	0.0061	6	0.3840	0.0410	-0.0265	-0.0465	0.0061
8	0.5120	0.0628	-0.0464	-0.0629	0.0096	8	0.5120	0.0628	-0.0464	-0.0629	0.0096
10	0.6217	0.0892	-0.0647	-0.0770	0.0142	10	0.6217	0.0892	-0.0647	-0.0770	0.0142
12	0.7369	0.1247	-0.0827	-0.0899	0.0195	12	0.7369	0.1247	-0.0827	-0.0899	0.0195
16	0.8996	0.2021	-0.1130	-0.1102	0.0305	16	0.8996	0.2021	-0.1130	-0.1102	0.0305
20	0.0423	0.2986	-0.1398	-0.1275	0.0221	20	0.0423	0.2986	-0.1398	-0.1275	0.0221

TABLE IV. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 30° AND TAPER RATIO OF 1 - Continued

(b) Full-span spoiler slot deflector;  $\delta_S = -0.075c$ ;  $\delta_d/\delta_S = 0.50$

$\alpha_j$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha_j$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$											
-4	-.6573	.1316	.0197	.0780	.0171	-4	-.6388	.1751	.0638	.0787	.0226
-2	-.5912	.1225	.0328	.0707	.0168	-2	-.5157	.1528	.0593	.0640	.0206
0	-.4865	.1133	.0545	.0597	.0158	0	-.3800	.1414	.0735	.0497	.0195
2	-.3929	.1133	.0676	.0503	.0149	2	-.2756	.1310	.0873	.0381	.0185
4	-.2937	.1051	.0748	.0384	.0144	4	-.1503	.1190	.0951	.0232	.0168
6	-.1505	.0987	.0768	.0220	.0133	6	.0146	.1138	.0989	.0054	.0156
8	.0147	.1005	.0722	.0025	.0127	8	.1858	.1206	.0795	-.0170	.0158
10	.2093	.1216	.0453	-.0230	.0138	10	.3278	.1336	.0582	-.0352	.0177
12	.3543	.1499	.0394	-.0377	.0169	12	.4656	.1570	.0466	-.0492	.0206
16	.5104	.2066	.0367	-.0512	.0237	16	.6180	.2120	.0369	-.0617	.0266
20	.6077	.2678	.0112	-.0629	.0320	20	.7015	.2755	.0108	-.0724	.0344
$M = 0.80$											
-4	-.6956	.1472	.0333	.0804	.0186	-4	-.5941	.1732	.0509	.0739	.0222
-2	-.5838	.1305	.0475	.0655	.0171	-2	-.4606	.1534	.0499	.0580	.0206
0	-.4646	.1206	.0679	.0574	.0163	0	-.3389	.1415	.0623	.0449	.0197
2	-.3752	.1144	.0821	.0474	.0158	2	-.2313	.1340	.0709	.0324	.0188
4	-.2509	.1051	.0910	.0340	.0146	4	-.1136	.1241	.0766	.0196	.0176
6	-.0894	.0983	.0959	.0166	.0132	6	.0399	.1186	.0830	.0017	.0165
8	.0969	.1045	.0715	-.0079	.0135	8	.2054	.1037	.0659	-.0205	.0174
10	.2634	.1194	.0755	-.0277	.0153	10	.3549	.1424	.0460	-.0384	.0197
12	.3975	.1447	.0533	-.0404	.0188	12	.4845	.1608	.0267	-.0546	.0224
16	.5342	.1942	.0413	-.0532	.0249	16	.6500	.2169	.0089	-.0700	.0283
20	.6186	.2554	.0142	-.0638	.0325	20	.7935	.2968	-.0160	-.0845	.0374
$M = 0.85$											
-4	-.6888	.1477	.0437	.0827	.0192	-4	-.5157	.1732	.0509	.0739	.0222
-2	-.5655	.1356	.0486	.0678	.0176	-2	-.4606	.1534	.0499	.0580	.0206
0	-.4584	.1269	.0728	.0568	.0171	0	-.3389	.1415	.0623	.0449	.0197
2	-.3467	.1164	.0915	.0448	.0161	2	-.2313	.1340	.0709	.0324	.0188
4	-.2281	.1066	.0969	.0319	.0148	4	-.1136	.1241	.0766	.0196	.0176
6	-.0814	.0979	.0985	.0149	.0138	6	.0399	.1186	.0830	.0017	.0165
8	.1187	.1049	.0728	-.0110	.0137	8	.2054	.1037	.0659	-.0205	.0174
10	.2862	.1182	.0570	-.0299	.0154	10	.3549	.1424	.0460	-.0384	.0197
12	.4026	.1419	.0553	-.0412	.0182	12	.4845	.1608	.0267	-.0546	.0224
16	.5422	.1935	.0441	-.0538	.0243	16	.6500	.2169	.0089	-.0700	.0283
20	.6353	.2566	.0141	-.0652	.0324	20	.7935	.2968	-.0160	-.0845	.0374
$M = 0.90$											
-4	-.6882	.1664	.0570	.0825	.0207	-4	-.5157	.1732	.0509	.0739	.0222
-2	-.5452	.1467	.0605	.0659	.0190	-2	-.4606	.1534	.0499	.0580	.0206
0	-.4287	.1335	.0805	.0542	.0182	0	-.3389	.1415	.0623	.0449	.0197
2	-.3166	.1253	.0939	.0420	.0172	2	-.2313	.1340	.0709	.0324	.0188
4	-.1847	.1117	.1017	.0279	.0155	4	-.1136	.1241	.0766	.0196	.0176
6	-.0374	.1067	.1080	.0113	.0145	6	.0399	.1186	.0830	.0017	.0165
8	.1451	.1117	.0809	-.0132	.0145	8	.2054	.1037	.0659	-.0205	.0174
10	.3100	.1253	.0625	-.0320	.0162	10	.3549	.1424	.0460	-.0384	.0197
12	.4353	.1483	.0589	-.0442	.0192	12	.4845	.1608	.0267	-.0546	.0224
16	.5716	.1751	.0475	-.0565	.0253	16	.6500	.2169	.0089	-.0700	.0283
20	.6640	.2698	.0161	-.0678	.0330	20	.7935	.2968	-.0160	-.0845	.0374
$M = 1.00$											
-4	-.5941	.1732	.0509	.0739	.0222	-4	-.5941	.1732	.0509	.0739	.0222
-2	-.4606	.1534	.0499	.0580	.0206	-2	-.4606	.1534	.0499	.0580	.0206
0	-.3389	.1415	.0623	.0449	.0197	0	-.3389	.1415	.0623	.0449	.0197
2	-.2313	.1340	.0709	.0324	.0188	2	-.2313	.1340	.0709	.0324	.0188
4	-.1136	.1241	.0766	.0196	.0176	4	-.1136	.1241	.0766	.0196	.0176
6	.0399	.1186	.0830	.0017	.0165	6	.0399	.1186	.0830	.0017	.0165
8	.2054	.1037	.0659	-.0205	.0174	8	.2054	.1037	.0659	-.0205	.0174
10	.3549	.1424	.0460	-.0384	.0197	10	.3549	.1424	.0460	-.0384	.0197
12	.4845	.1608	.0267	-.0546	.0224	12	.4845	.1608	.0267	-.0546	.0224
16	.6500	.2169	.0089	-.0700	.0283	16	.6500	.2169	.0089	-.0700	.0283
20	.7935	.2968	-.0160	-.0845	.0374	20	.7935	.2968	-.0160	-.0845	.0374
$M = 1.05$											
-4	-.5157	.1732	.0509	.0739	.0222	-4	-.5157	.1732	.0509	.0739	.0222
-2	-.4606	.1534	.0499	.0580	.0206	-2	-.4606	.1534	.0499	.0580	.0206
0	-.3389	.1415	.0623	.0449	.0197	0	-.3389	.1415	.0623	.0449	.0197
2	-.2313	.1340	.0709	.0324	.0188	2	-.2313	.1340	.0709	.0324	.0188
4	-.1136	.1241	.0766	.0196	.0176	4	-.1136	.1241	.0766	.0196	.0176
6	.0399	.1186	.0830	.0017	.0165	6	.0399	.1186	.0830	.0017	.0165
8	.2054	.1037	.0659	-.0205	.0174	8	.2054	.1037	.0659	-.0205	.0174
10	.3549	.1424	.0460	-.0384	.0197	10	.3549	.1424	.0460	-.0384	.0197
12	.4845	.1608	.0267	-.0546	.0224	12	.4845	.1608	.0267	-.0546	.0224
16	.6500	.2169	.0089	-.0700	.0283	16	.6500	.2169	.0089	-.0700	.0283
20	.7935	.2968	-.0160	-.0845	.0374	20	.7935	.2968	-.0160	-.0845	.0374
$M = 1.10$											
-4	-.5157	.1732	.0509	.0739	.0222	-4	-.5157	.1732	.0509	.0739	.0222
-2	-.4606	.1534	.0499	.0580	.0206	-2	-.4606	.1534	.0499	.0580	.0206
0	-.3389	.1415	.0623	.0449	.0197	0	-.3389	.1415	.0623	.0449	.0197
2	-.2313	.1340	.0709	.0324	.0188	2	-.2313	.1340	.0709	.0324	.0188
4	-.1136	.1241	.0766	.0196	.0176	4	-.1136	.1241	.0766	.0196	.0176
6	.0399	.1186	.0830	.0017	.0165	6	.0399	.1186	.0830	.0017	.0165
8	.2054	.1037	.0659	-.0205	.0174	8	.2054	.1037	.0659	-.0205	.0174
10	.3549	.1424	.0460	-.0384	.0197	10	.3549	.1424	.0460	-.0384	.0197
12	.4845	.1608	.0267	-.0546	.0224	12	.4845	.1608	.0267	-.0546	.0224
16	.6500	.2169	.0089	-.0700	.0283	16	.6500	.2169	.0089	-.0700	.0283
20	.7935	.2968	-.0160	-.0845	.0374	20	.7935	.2968	-.0160	-.0845	.0374

TABLE IV.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH

SWEEP OF 30° AND TAPER RATIO OF 1 - Continued

(c) Half-span spoiler slot deflector;  $\delta_s = -0.075c$ ;  $\delta_d/\delta_s = 0.50$ 

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$						$M = 0.95$					
-4	-0.5386	0.0894	0.0285	0.0548	0.0169	-4	-0.5401	0.1252	0.0166	0.0595	0.0180
-2	-0.4479	0.0849	0.0382	0.0433	0.0151	-2	-0.4164	0.1062	0.0118	0.0438	0.0158
0	-0.3173	0.0894	0.0194	0.0300	0.0118	0	-0.2906	0.0934	0.0184	0.0288	0.0146
2	-0.2140	0.0984	0.0130	0.0186	0.0103	2	-0.1505	0.0842	0.0239	0.0147	0.0137
4	-0.0961	0.1047	0.0052	0.0054	0.0094	4	-0.0350	0.0806	0.0295	0.0014	0.0137
6	0.0326	0.1138	0.0065	-0.0092	0.0086	6	0.1154	0.0852	0.0313	-0.0159	0.0139
8	0.1342	0.1255	0.0227	-0.0256	0.0103	8	0.2535	0.0970	0.0247	-0.0335	0.0162
10	0.3010	0.1625	0.0292	-0.0438	0.0151	10	0.4081	0.1201	0.0074	-0.0512	0.0197
12	0.4261	0.1923	0.0207	-0.0547	0.0207	12	0.5421	0.1509	-0.0129	-0.0653	0.0249
16	0.5422	0.2519	0.0272	-0.0640	0.0258	16	0.6761	0.2124	-0.0239	-0.0745	0.0316
20	0.6528	0.3151	0.2974	-0.0742	0.0396	20	0.7586	0.2853	-0.0460	-0.0830	0.0395
$M = 0.80$						$M = 1.00$					
-4	-0.5667	0.1032	0.0162	0.0594	0.0164	-4	-0.5059	0.1245	0.0123	0.0565	0.0169
-2	-0.4440	0.0934	0.0075	0.0460	0.0150	-2	-0.3602	0.1049	0.0056	0.0379	0.0156
0	-0.3152	0.0849	0.0009	0.0311	0.0131	0	-0.2402	0.0941	0.0035	0.0244	0.0124
2	-0.2232	0.0788	0.0013	0.0197	0.0119	2	-0.1220	0.0877	0.0035	0.0113	0.0122
4	-0.1128	0.0800	0.0039	0.0065	0.0118	4	-0.0039	0.0867	0.0053	-0.0025	0.0104
6	0.0380	0.0855	0.0096	-0.0105	0.0108	6	0.1339	0.0902	0.0123	-0.0185	0.0134
8	0.1877	0.1069	0.0022	-0.0279	0.0137	8	0.2815	0.1044	0.0025	-0.0374	0.0152
10	0.3532	0.1337	0.0118	-0.0462	0.0169	10	0.4193	0.1294	-0.0158	-0.0543	0.0185
12	0.4636	0.1600	0.0070	-0.0540	0.0215	12	0.5571	0.1539	-0.0369	-0.0703	0.0230
16	0.5863	0.2070	0.0123	-0.0641	0.0299	16	0.7539	0.2274	-0.0703	-0.0910	0.0297
20	0.6844	0.2724	0.0333	-0.0741	0.0407	20	0.8524	0.3078	-0.0721	-0.0978	0.0352
$M = 0.85$						$M = 1.05$					
-4	-0.5903	0.1121	0.0103	0.0620	0.0169	-4	-0.4646	0.1128	0.0091	0.0529	0.0104
-2	-0.4410	0.0949	0.0070	0.0452	0.0152	-2	-0.3437	0.1006	0.0024	0.0382	0.0074
0	-0.3147	0.0863	0.0021	0.0309	0.0144	0	-0.2210	0.0936	0.0034	0.0247	0.0066
2	-0.2113	0.0783	0.0082	0.0187	0.0136	2	-0.1171	0.0912	-0.0017	0.0102	0.0034
4	-0.0758	0.0749	0.0144	0.0045	0.0130	4	-0.0132	0.0936	0.0017	-0.0027	0.0040
6	0.0643	0.0795	0.0185	-0.0122	0.0125	6	0.1284	0.0936	0.0034	-0.0205	0.0040
8	0.2136	0.0978	0.0123	-0.0299	0.0148	8	0.2701	0.1105	-0.0051	-0.0372	0.0068
10	0.3744	0.1252	0.0041	-0.0472	0.0176	10	0.4136	0.1321	-0.0253	-0.0545	0.0107
12	0.4778	0.1538	0.0029	-0.0547	0.0214	12	0.5345	0.1613	-0.0503	-0.0707	0.0133
16	0.6041	0.2110	0.0103	-0.0653	0.0296	16	0.7328	0.2252	-0.0877	-0.0938	0.0225
20	0.6960	0.2767	0.0361	-0.0757	0.0397	20	0.8934	0.3141	-0.1164	-0.1245	0.0337
$M = 0.90$						$M = 1.10$					
-4	-0.5752	0.1162	0.0008	0.0613	0.0174	-4	-0.4504	0.1040	0.0186	0.0523	0.0030
-2	-0.4385	0.0978	0.0008	0.0465	0.0156	-2	-0.3501	0.0949	0.0000	0.0379	0.0012
0	-0.3082	0.0886	0.0097	0.0303	0.0145	0	-0.2225	0.0949	0.0000	0.0231	0.0005
2	-0.1997	0.0805	0.0155	0.0182	0.0138	2	-0.1295	0.0858	-0.0042	0.0111	-0.0016
4	-0.0586	0.0762	0.0244	0.0033	0.0135	4	-0.0109	0.0903	0.0016	-0.0023	-0.0007
6	0.0825	0.0778	0.0271	-0.0125	0.0135	6	0.1422	0.0903	0.0046	-0.0198	0.0020
8	0.2279	0.0940	0.0252	-0.0310	0.0149	8	0.2699	0.1130	-0.0029	-0.0367	0.0020
10	0.3864	0.1210	0.0019	-0.0489	0.0184	10	0.3976	0.1357	-0.0218	-0.0531	0.0038
12	0.5058	0.1502	0.0008	-0.0576	0.0227	12	0.5161	0.1648	-0.0505	-0.0687	0.0072
16	0.6252	0.2102	0.0089	-0.0673	0.0301	16	0.7076	0.2315	-0.0857	-0.0918	0.0138
20	0.7250	0.2767	0.0407	-0.0781	0.0398	20	0.8571	0.2987	-0.1352	-0.1106	0.0263

TABLE IV.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 30° AND TAPER RATIO OF 1 - Continued

(d) Half-span spoiler slot deflector;  $\delta_s = -0.075c$ ;  $\delta_d/\delta_s = 0.75$

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$											
-4	-0.5394	0.1071	0.0065	0.0548	0.0078	-4	-0.4922	0.1148	0.0055	0.0540	0.0078
-2	-0.4192	0.0880	0.0098	0.0410	0.0063	-2	-0.3888	0.1019	0.0028	0.0404	0.0069
0	-0.3025	0.0798	0.0016	0.0279	0.0055	0	-0.2544	0.0906	0.0139	0.0248	0.0063
2	-0.2242	0.0753	0.0065	0.0183	0.0053	2	-0.1634	0.0891	0.0185	0.0136	0.0063
4	-0.1294	0.0735	0.0140	0.0070	0.0052	4	-0.0538	0.0813	0.0314	0.0007	0.0060
6	-0.0018	0.0726	0.0195	-0.0072	0.0055	6	0.1013	0.0813	0.0397	-0.0152	0.0062
8	0.1349	0.0871	0.0260	-0.0222	0.0070	8	0.2254	0.0916	0.0388	-0.0303	0.0087
10	0.2898	0.1116	0.0130	-0.0395	0.0117	10	0.3495	0.1164	0.0249	-0.0452	0.0128
12	0.3900	0.1388	0.0130	-0.0473	0.0155	12	0.4529	0.1457	0.0129	-0.0545	0.0172
16	0.5121	0.1933	0.0179	-0.0554	0.0213	16	0.5770	0.1972	0.0028	-0.0634	0.0235
20	0.5868	0.2504	0.0147	-0.0643	0.0291	20	0.6701	0.2657	-0.0286	-0.0747	0.0324
$M = 0.80$											
-4	-0.5244	0.1060	0.0110	0.0540	0.0071	-4	-0.4701	0.1210	0.0115	0.0519	0.0092
-2	-0.4075	0.0907	0.0066	0.0405	0.0061	-2	-0.3476	0.1062	0.0079	0.0370	0.0079
0	-0.2967	0.0815	0.0022	0.0274	0.0056	0	-0.2390	0.0964	0.0132	0.0232	0.0074
2	-0.2105	0.0785	0.0110	0.0173	0.0053	2	-0.1402	0.0915	0.0150	0.0122	0.0074
4	-0.0997	0.0754	0.0198	0.0051	0.0053	4	-0.0217	0.0895	0.0212	-0.0014	0.0074
6	0.0357	0.0735	0.0264	-0.0099	0.0054	6	0.1264	0.0885	0.0300	-0.0183	0.0078
8	0.1896	0.0864	0.0264	-0.0270	0.0081	8	0.2548	0.1013	0.0238	-0.0352	0.0108
10	0.3250	0.1109	0.0132	-0.0422	0.0124	10	0.3832	0.1210	0.0124	-0.0492	0.0139
12	0.4087	0.1367	0.0172	-0.0479	0.0157	12	0.5017	0.1505	-0.0168	-0.0639	0.0188
16	0.5158	0.1857	0.0176	-0.0557	0.0216	16	0.6399	0.2095	-0.0300	-0.0758	0.0264
20	0.5897	0.2470	0.0143	-0.0649	0.0296	20	0.7683	0.2832	-0.0547	-0.0839	0.0350
$M = 0.85$											
-4	-0.5197	0.1067	0.0082	0.0553	0.0074	-4	-0.4663	0.1227	0.0085	0.0506	0.0093
-2	-0.4045	0.0935	0.0056	0.0405	0.0061	-2	-0.3431	0.1067	0.0051	0.0360	0.0078
0	-0.2892	0.0849	0.0027	0.0262	0.0057	0	-0.2294	0.0972	0.0288	0.0222	0.0072
2	-0.1970	0.0803	0.0124	0.0162	0.0055	2	-0.1289	0.0878	0.0152	0.0109	0.0070
4	-0.0876	0.0734	0.0206	0.0037	0.0053	4	-0.0209	0.0878	0.0196	-0.0018	0.0070
6	0.0507	0.0734	0.0288	-0.0114	0.0056	6	0.1213	0.0878	0.0254	-0.0183	0.0079
8	0.2005	0.0878	0.0278	-0.0286	0.0082	8	0.2635	0.1010	0.0186	-0.0354	0.0102
10	0.3330	0.1107	0.0124	-0.0434	0.0124	10	0.3772	0.1208	0.0000	-0.0500	0.0131
12	0.4194	0.1394	0.0144	-0.0480	0.0157	12	0.4910	0.1472	-0.0210	-0.0640	0.0178
16	0.5174	0.1882	0.0175	-0.0564	0.0217	16	0.6711	0.2105	-0.0660	-0.0841	0.0277
20	0.5969	0.2484	0.0165	-0.0661	0.0298	20	0.7943	0.2860	-0.0830	-0.0935	0.0371
$M = 0.90$											
-4	-0.5249	0.1128	0.0039	0.0571	0.0076	-4	-0.4594	0.1166	0.0082	0.0505	0.0086
-2	-0.4051	0.0981	0.0039	0.0420	0.0066	-2	-0.3496	0.1030	0.0016	0.0364	0.0074
0	-0.2810	0.0884	0.0058	0.0265	0.0059	0	-0.2306	0.0920	0.0082	0.0215	0.0067
2	-0.1873	0.0830	0.0156	0.0157	0.0056	2	-0.1208	0.0875	0.0147	0.0097	0.0066
4	-0.0675	0.0764	0.0230	0.0022	0.0055	4	-0.0110	0.0848	0.0196	-0.0028	0.0066
6	0.0741	0.0775	0.0311	-0.0140	0.0059	6	0.1171	0.0875	0.0255	-0.0185	0.0073
8	0.2200	0.0884	0.0331	-0.0302	0.0087	8	0.2544	0.0984	0.0164	-0.0350	0.0099
10	0.3354	0.1101	0.0146	-0.0444	0.0127	10	0.3734	0.1166	-0.0016	-0.0498	0.0296
12	0.4378	0.1399	0.0185	-0.0500	0.0164	12	0.4832	0.1440	-0.0213	-0.0624	0.0168
16	0.5532	0.1984	0.0136	-0.0602	0.0233	16	0.6571	0.2032	-0.0644	-0.0824	0.0263
20	0.6294	0.2565	0.0195	-0.0696	0.0311	20	0.8090	0.2852	-0.0948	-0.0962	0.0372
$M = 1.00$											
-4	-0.4701	0.1210	0.0115	0.0519	0.0092	-4	-0.4663	0.1227	0.0085	0.0506	0.0093
-2	-0.3476	0.1062	0.0079	0.0370	0.0079	-2	-0.3431	0.1067	0.0051	0.0360	0.0078
0	-0.2390	0.0964	0.0132	0.0232	0.0074	0	-0.2294	0.0972	0.0288	0.0222	0.0072
2	-0.1402	0.0915	0.0150	0.0122	0.0074	2	-0.1289	0.0878	0.0152	0.0109	0.0070
4	-0.0217	0.0895	0.0212	-0.0014	0.0074	4	-0.0209	0.0878	0.0196	-0.0018	0.0070
6	0.1264	0.0885	0.0300	-0.0183	0.0078	6	0.1213	0.0878	0.0254	-0.0183	0.0079
8	0.2548	0.1013	0.0238	-0.0352	0.0108	8	0.2635	0.1010	0.0186	-0.0354	0.0102
10	0.3832	0.1210	0.0124	-0.0492	0.0139	10	0.3772	0.1208	0.0000	-0.0500	0.0131
12	0.5017	0.1505	-0.0168	-0.0639	0.0188	12	0.4910	0.1472	-0.0210	-0.0640	0.0178
16	0.6399	0.2095	-0.0300	-0.0758	0.0264	16	0.6711	0.2105	-0.0660	-0.0841	0.0277
20	0.7683	0.2832	-0.0547	-0.0839	0.0350	20	0.7943	0.2860	-0.0830	-0.0935	0.0371
$M = 1.05$											
-4	-0.4663	0.1227	0.0085	0.0506	0.0093	-4	-0.4663	0.1227	0.0085	0.0506	0.0093
-2	-0.3431	0.1067	0.0051	0.0360	0.0078	-2	-0.3431	0.1067	0.0051	0.0360	0.0078
0	-0.2294	0.0972	0.0288	0.0222	0.0072	0	-0.2294	0.0972	0.0288	0.0222	0.0072
2	-0.1289	0.0878	0.0152	0.0109	0.0070	2	-0.1289	0.0878	0.0152	0.0109	0.0070
4	-0.0209	0.0878	0.0196	-0.0018	0.0070	4	-0.0209	0.0878	0.0196	-0.0018	0.0070
6	0.1213	0.0878	0.0254	-0.0183	0.0079	6	0.1213	0.0878	0.0254	-0.0183	0.0079
8	0.2635	0.1010	0.0186	-0.0354	0.0102	8	0.2635	0.1010	0.0186	-0.0354	0.0102
10	0.3772	0.1208	0.0000	-0.0500	0.0131	10	0.3772	0.1208	0.0000	-0.0500	0.0131
12	0.4910	0.1472	-0.0210	-0.0640	0.0178	12	0.4910	0.1472	-0.0210	-0.0640	0.0178
16	0.6711	0.2105	-0.0660	-0.0841	0.0277	16	0.6711	0.2105	-0.0660	-0.0841	0.0277
20	0.7943	0.2860	-0.0830	-0.0935	0.0371	20	0.7943	0.2860	-0.0830	-0.0935	0.0371
$M = 1.10$											
-4	-0.4594	0.1166	0.0082	0.0505	0.0086	-4	-0.4594	0.1166	0.0082	0.0505	0.0086
-2	-0.3496	0.1030	0.0016	0.0364	0.0074	-2	-0.3496	0.1030	0.0016	0.0364	0.0074
0	-0.2306	0.0920	0.0082	0.0215	0.0067	0	-0.2306	0.0920	0.0082	0.0215	0.0067
2	-0.1208	0.0875	0.0147	0.0097	0.0066	2	-0.1208	0.0875	0.0147	0.0097	0.0066
4	-0.0110	0.0848	0.0196	-0.0028	0.0066	4	-0.0110	0.0848	0.0196	-0.0028	0.0066
6	0.1171	0.0875	0.0255	-0.0185	0.0073	6	0.1171	0.0875	0.0255	-0.0185	0.0073
8	0.2544	0.0984	0.0164	-0.0350	0.0099	8	0.2544	0.0984	0.0164	-0.0350	0.0099
10	0.3734	0.1166	-0.0016	-0.0498	0.0296	10	0.3734	0.1166	-0.0016	-0.0498	0.0296
12	0.4832	0.1440	-0.0213	-0.0624	0.0168	12	0.4832	0.1440	-0.0213	-0.0624	0.0168
16	0.6571	0.2032	-0.0644	-0.0824	0.0263	16	0.6571	0.2032	-0.0644	-0.0824	0.0263
20	0.8090	0.2852	-0.0948	-0.0962	0.0372	20	0.8090	0.2852	-0.0948	-0.0962	0.0372

TABLE IV. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 30° AND TAPER RATIO OF 1 - Concluded

(e) Half-span spoiler slot deflector;  $\delta_s = -0.075c$ ;  $\delta_d/\delta_s = 1.00$ 

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$		$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
<b>M = 0.60</b>											<b>M = 0.95</b>	
-4	-0.4859	0.1142	0.0267	0.0506	0.0088		-4	-0.4595	0.1252	-0.0214	0.0505	0.0091
-2	-0.3494	0.0979	0.0234	0.0358	0.0075		-2	-0.3353	0.1175	-0.0152	0.0351	0.0083
0	-0.2584	0.0933	0.0150	0.0245	0.0070		0	-0.2111	0.1097	-0.0041	0.0209	0.0078
2	-0.1765	0.0888	0.0052	0.0143	0.0068		2	-0.1283	0.1061	0.0033	0.0101	0.0078
4	-0.0855	0.0888	0.0059	0.0031	0.0063		4	-0.0145	0.0994	0.0181	-0.0028	0.0078
6	0.0328	0.0915	0.0124	-0.0104	0.0065		6	0.1097	0.1020	0.0311	-0.0177	0.0081
8	0.1602	0.1069	0.0189	-0.0257	0.0086		8	0.2442	0.1149	0.0329	-0.0337	0.0110
10	0.3058	0.1341	0.0098	-0.0419	0.0135		10	0.3725	0.1381	0.0163	-0.0484	0.0152
12	0.3931	0.1613	0.0156	-0.0475	0.0168		12	0.4615	0.1680	0.0144	-0.0556	0.0194
16	0.4696	0.2084	0.0267	-0.0521	0.0223		16	0.5443	0.2205	0.0181	-0.0617	0.0256
20	0.5114	0.2610	0.0013	-0.0583	0.0294		20	0.6167	0.2762	-0.0004	-0.0693	0.0050
<b>M = 0.80</b>											<b>M = 1.00</b>	
-4	-0.4701	0.1146	0.0290	0.0501	0.0082		-4	-0.4388	0.1407	-0.0180	0.0482	0.0102
-2	-0.3470	0.1029	0.0246	0.0357	0.0071		-2	-0.3202	0.1210	-0.0145	0.0338	0.0090
0	-0.2363	0.0968	0.0123	0.0220	0.0065		0	-0.2115	0.1181	-0.0057	0.0200	0.0088
2	-0.1501	0.0919	0.0013	0.0121	0.0065		2	-0.1225	0.1112	0.0032	0.0088	0.0088
4	-0.0480	0.0895	0.0084	0.0004	0.0065		4	-0.0040	0.1063	0.0120	-0.0046	0.0086
6	0.0751	0.0907	0.0193	-0.0140	0.0070		6	0.1344	0.1112	0.0208	-0.0203	0.0097
8	0.2190	0.1091	0.0163	-0.0313	0.0103		8	0.2629	0.1240	0.0191	-0.0364	0.0126
10	0.3606	0.1336	0.0084	-0.0458	0.0142		10	0.3913	0.1456	0.0095	-0.0516	0.0160
12	0.4283	0.1611	0.0172	-0.0506	0.0177		12	0.4862	0.1752	-0.0074	-0.0635	0.0207
16	0.4836	0.2010	0.0259	-0.0537	0.0225		16	0.5890	0.2244	0.0032	-0.0685	0.0273
20	0.5304	0.2561	0.0040	-0.0603	0.0295		20	0.7174	0.3031	-0.0286	-0.0829	0.0370
<b>M = 0.85</b>											<b>M = 1.05</b>	
-4	-0.4751	0.1165	0.0313	0.0504	0.0082		-4	-0.4210	0.1378	-0.0173	0.0466	0.0101
-2	-0.3540	0.1051	0.0239	0.0363	0.0074		-2	-0.3110	0.1256	-0.0156	0.0325	0.0090
0	-0.2329	0.0993	0.0128	0.0223	0.0070		0	-0.1896	0.1161	-0.0037	0.0187	0.0088
2	-0.1464	0.0936	0.0004	0.0079	0.0067		2	-0.1081	0.1114	0.0041	0.0078	0.0086
4	-0.0392	0.0907	0.0107	-0.0010	0.0066		4	0.0057	0.1067	0.0115	-0.0049	0.0086
6	0.1015	0.0936	0.0223	-0.0162	0.0071		6	0.1479	0.1114	0.0217	-0.0213	0.0094
8	0.2341	0.1091	0.0181	-0.0332	0.0105		8	0.2712	0.1256	0.0183	-0.0375	0.0123
10	0.3667	0.1338	0.0078	-0.0468	0.0144		10	0.3757	0.1445	0.0047	-0.0510	0.0155
12	0.4359	0.1596	0.0173	-0.0509	0.0179		12	0.4798	0.1728	-0.0122	-0.0637	0.0198
16	0.5050	0.2084	0.0264	-0.0559	0.0233		16	0.6504	0.2341	-0.0461	-0.0828	0.0298
20	0.5396	0.2601	0.0041	-0.0616	0.0302		20	0.7358	0.3031	-0.0495	-0.0880	0.0383
<b>M = 0.90</b>											<b>M = 1.10</b>	
-4	-0.4817	0.1226	0.0288	0.0517	0.0086		-4	-0.4156	0.1331	-0.0173	0.0464	0.0095
-2	-0.3509	0.1118	0.0199	0.0360	0.0077		-2	-0.3149	0.1176	-0.0200	0.0328	0.0084
0	-0.2310	0.1047	0.0082	0.0218	0.0072		0	-0.1904	0.1094	-0.0052	0.0183	0.0081
2	-0.1384	0.0993	0.0035	0.0112	0.0071		2	-0.0989	0.1076	0.0029	0.0071	0.0080
4	-0.0294	0.0955	0.0152	-0.0013	0.0071		4	0.0146	0.1030	0.0137	-0.0058	0.0082
6	0.1068	0.0977	0.0280	-0.0172	0.0077		6	0.1337	0.1076	0.0209	-0.0204	0.0088
8	0.2539	0.1101	0.0249	-0.0338	0.0106		8	0.2618	0.1212	0.0170	-0.0368	0.0116
10	0.3792	0.1373	0.0105	-0.0485	0.0149		10	0.3808	0.1422	0.0046	-0.0505	0.0148
12	0.4446	0.1660	0.0152	-0.0526	0.0185		12	0.4724	0.1668	-0.0121	-0.0622	0.0191
16	0.5318	0.2159	0.0230	-0.0590	0.0246		16	0.6372	0.2261	-0.0445	-0.0792	0.0284
20	0.5623	0.2675	0.0035	-0.0644	0.0316		20	0.7470	0.2990	-0.0576	-0.0897	0.0380

TABLE V. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 0

## (a) Plain wing

$\alpha$ , deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$	$\alpha$ , deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$
$M = 0.60$											
-4	-0.3043	0.0181	0.0403	0.0292	0.0010	-4	-0.3775	0.0351	0.0733	0.0369	0.0018
-2	-0.1950	0.0136	0.0284	0.0192	0.0010	-2	-0.2220	0.0155	0.0473	0.0229	0.0005
0	-0.0674	0.0118	0.0143	0.0059	0.0002	0	-0.0560	0.0077	0.0250	0.0071	-0.0003
2	0.0419	0.0136	0.0007	-0.0058	0.0002	2	0.0892	0.0093	-0.0033	-0.0083	0.0001
4	0.1658	0.0227	0.0111	-0.0178	0.0008	4	0.2137	0.0170	-0.0297	-0.0222	0.0017
6	0.2879	0.0454	0.0197	-0.0292	0.0030	6	0.3692	0.0361	-0.0518	-0.0368	0.0045
8	0.4064	0.0708	0.0257	-0.0385	0.0062	8	0.5207	0.0671	-0.0726	-0.0483	0.0082
10	0.5303	0.1125	0.0215	-0.0471	0.0098	10	0.6285	0.1033	-0.0808	-0.0560	0.0117
12	0.6160	0.1497	0.0172	-0.0529	0.0140	12	0.7115	0.1420	-0.0831	-0.0611	0.0154
16	0.7709	0.2377	0.0219	-0.0616	0.0215	16	0.8214	0.2220	-0.0845	-0.0679	0.0222
20	0.8620	0.3339	0.0268	-0.0646	0.0288	20	0.9500	0.3284	-0.1052	-0.0737	0.0304
$M = 0.80$											
-4	-0.3292	0.0233	0.0463	0.0318	0.0017	-4	-0.3548	0.0385	0.0939	0.0370	0.0023
-2	-0.1997	0.0092	0.0296	0.0200	0.0008	-2	-0.2022	0.0197	0.0626	0.0226	0.0009
0	-0.0641	0.0061	0.0151	0.0069	0.0001	0	-0.0396	0.0123	0.0199	0.0217	-0.0001
2	0.0592	0.0080	0.0039	-0.0065	0.0001	2	0.0951	0.0173	-0.0117	-0.0093	0.0006
4	0.1887	0.0153	0.0158	-0.0191	0.0015	4	0.2339	0.0222	-0.0509	-0.0246	0.0024
6	0.3243	0.0356	0.0269	-0.0315	0.0038	6	0.3826	0.0370	-0.0716	-0.0384	0.0052
8	0.4538	0.0645	0.0368	-0.0417	0.0070	8	0.5213	0.0706	-0.0962	-0.0504	0.0083
10	0.5709	0.1001	0.0312	-0.0496	0.0106	10	0.6601	0.1086	-0.1217	-0.0614	0.0124
12	0.6486	0.1381	0.0328	-0.0545	0.0140	12	0.7691	0.1530	-0.1341	-0.0691	0.0170
16	0.7965	0.2241	0.0478	-0.0621	0.0213	16	0.9753	0.2615	-0.1699	-0.0852	0.0266
20	0.8705	0.3069	0.0597	-0.0652	0.0281	20	0.0625	0.3652	-0.1640	-0.0872	0.0352
$M = 0.85$											
-4	-0.3390	0.0218	0.0463	0.0329	0.0019	-4	-0.3372	0.0356	0.0891	0.0349	0.0022
-2	-0.2006	0.0086	0.0324	0.0204	0.0006	-2	-0.1848	0.0213	0.0530	0.0192	0.0009
0	-0.0553	0.0046	0.0161	0.0061	-0.0001	0	-0.0324	0.0138	0.0147	0.0031	-0.0002
2	0.0692	0.0057	0.0030	-0.0071	0.0001	2	0.0914	0.0156	-0.0112	-0.0093	0.0004
4	0.2029	0.0144	0.0199	-0.0203	0.0018	4	0.2153	0.0237	-0.0472	-0.0230	0.0022
6	0.3413	0.0344	0.0337	-0.0331	0.0042	6	0.3677	0.0417	-0.0804	-0.0387	0.0047
8	0.4796	0.0603	0.0382	-0.0431	0.0075	8	0.5296	0.0735	-0.1048	-0.0517	0.0084
10	0.5834	0.0947	0.0614	-0.0502	0.0111	10	0.6534	0.1105	-0.1277	-0.0615	0.0124
12	0.6641	0.1349	0.0419	-0.0557	0.0146	12	0.7677	0.1589	-0.1513	-0.0721	0.0175
16	0.7909	0.2181	0.0561	-0.0624	0.0215	16	0.9639	0.2561	-0.1862	-0.0855	0.0269
20	0.8832	0.3100	0.0714	-0.0665	0.0288	20	0.1277	0.3889	-0.2177	-0.0972	0.0387
$M = 0.90$											
-4	-0.3641	0.0277	0.0541	0.0345	0.0019	-4	-0.3255	0.0343	0.0846	0.0337	0.0020
-2	-0.2115	0.0125	0.0372	0.0218	0.0006	-2	-0.1784	0.0197	0.0501	0.0191	0.0007
0	-0.0589	0.0081	0.0204	0.0071	-0.0001	0	-0.0221	0.0128	0.0136	0.0028	-0.0001
2	0.0720	0.0081	0.0045	-0.0077	0.0000	2	0.0883	0.0137	-0.0118	-0.0088	0.0003
4	0.2202	0.0163	0.0217	0.0153	0.0020	4	0.2170	0.0252	-0.0447	-0.0230	0.0017
6	0.3554	0.0331	0.0373	-0.0342	0.0046	6	0.3641	0.0426	-0.0776	-0.0376	0.0041
8	0.4862	0.0624	0.0503	-0.0452	0.0069	8	0.4929	0.0710	-0.1030	-0.0493	0.0075
10	0.6018	0.0950	0.0530	-0.0525	0.0115	10	0.6216	0.1099	-0.1242	-0.0597	0.0123
12	0.6933	0.1373	0.0549	-0.0581	0.0153	12	0.7319	0.1547	-0.1445	-0.0691	0.0162
16	0.8198	0.2198	0.0670	-0.0648	0.0221	16	0.9306	0.2591	-0.1794	-0.0835	0.0255
20	0.9114	0.3202	0.0875	-0.0696	0.0298	20	0.0961	0.3891	-0.2139	-0.0951	0.0369
$M = 1.00$											
-4	-0.3548	0.0385	0.0939	0.0370	0.0023	-4	-0.3548	0.0385	0.0939	0.0370	0.0023
-2	-0.2022	0.0197	0.0626	0.0226	0.0009	-2	-0.2022	0.0197	0.0626	0.0226	0.0009
0	-0.0396	0.0123	0.0199	0.0217	-0.0001	0	-0.0396	0.0123	0.0199	0.0217	-0.0001
2	0.0951	0.0173	-0.0117	-0.0093	0.0006	2	0.0951	0.0173	-0.0117	-0.0093	0.0006
4	0.2339	0.0222	-0.0509	-0.0246	0.0024	4	0.2339	0.0222	-0.0509	-0.0246	0.0024
6	0.3826	0.0370	-0.0716	-0.0384	0.0052	6	0.3826	0.0370	-0.0716	-0.0384	0.0052
8	0.5213	0.0706	-0.0962	-0.0504	0.0083	8	0.5213	0.0706	-0.0962	-0.0504	0.0083
10	0.6601	0.1086	-0.1217	-0.0614	0.0124	10	0.6601	0.1086	-0.1217	-0.0614	0.0124
12	0.7691	0.1530	-0.1341	-0.0691	0.0170	12	0.7691	0.1530	-0.1341	-0.0691	0.0170
16	0.9753	0.2615	-0.1699	-0.0852	0.0266	16	0.9753	0.2615	-0.1699	-0.0852	0.0266
20	0.0625	0.3652	-0.1640	-0.0872	0.0352	20	0.0625	0.3652	-0.1640	-0.0872	0.0352
$M = 1.05$											
-4	-0.3372	0.0356	0.0891	0.0349	0.0022	-4	-0.3372	0.0356	0.0891	0.0349	0.0022
-2	-0.1848	0.0213	0.0530	0.0192	0.0009	-2	-0.1848	0.0213	0.0530	0.0192	0.0009
0	-0.0324	0.0138	0.0147	0.0031	-0.0002	0	-0.0324	0.0138	0.0147	0.0031	-0.0002
2	0.0914	0.0156	-0.0112	-0.0093	0.0004	2	0.0914	0.0156	-0.0112	-0.0093	0.0004
4	0.2153	0.0237	-0.0472	-0.0230	0.0022	4	0.2153	0.0237	-0.0472	-0.0230	0.0022
6	0.3677	0.0417	-0.0804	-0.0387	0.0047	6	0.3677	0.0417	-0.0804	-0.0387	0.0047
8	0.5296	0.0735	-0.1048	-0.0517	0.0084	8	0.5296	0.0735	-0.1048	-0.0517	0.0084
10	0.6534	0.1105	-0.1277	-0.0615	0.0124	10	0.6534	0.1105	-0.1277	-0.0615	0.0124
12	0.7677	0.1589	-0.1513	-0.0721	0.0175	12	0.7677	0.1589	-0.1513	-0.0721	0.0175
16	0.9639	0.2561	-0.1862	-0.0855	0.0269	16	0.9639	0.2561	-0.1862	-0.0855	0.0269
20	0.1277	0.3889	-0.2177	-0.0972	0.0387	20	0.1277	0.3889	-0.2177	-0.0972	0.0387
$M = 1.10$											
-4	-0.3255	0.0343	0.0846	0.0337	0.0020	-4	-0.3255	0.0343	0.0846	0.0337	0.0020
-2	-0.1784	0.0197	0.0501	0.0191	0.0007	-2	-0.1784	0.0197	0.0501	0.0191	0.0007
0	-0.0221	0.0128	0.0136	0.0028	-0.0001	0	-0.0221	0.0128	0.0136	0.0028	-0.0001
2	0.0883	0.0137	-0.0118	-0.0088	0.0003	2	0.0883	0.0137	-0.0118	-0.0088	0.0003
4	0.2170	0.0252	-0.0447	-0.0230	0.0017	4	0.2170	0.0252	-0.0447	-0.0230	0.0017
6	0.3641	0.0426	-0.0776	-0.0376	0.0041	6	0.3641	0.0426	-0.0776	-0.0376	0.0041
8	0.4929	0.0710	-0.1030	-0.0493	0.0075	8	0.4929	0.0710	-0.1030	-0.0493	0.0075
10	0.6216	0.1099	-0.1242	-0.0597	0.0123	10	0.6216	0.1099	-0.1242	-0.0597	0.0123
12	0.7319	0.1547	-0.1445	-0.0691	0.0162	12	0.7319	0.1547	-0.1445	-0.0691	0.0162
16	0.9306	0.2591	-0.1794	-0.0835	0.0255	16	0.9306	0.2591	-0.1794	-0.0835	0.0255
20	0.0961	0.3891	-0.2139	-0.0951	0.0369	20	0.0961	0.3891	-0.2139	-0.0951	0.0369

TABLE V. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 0 - Continued

(b) Half-span spoiler slot deflector;  $\delta_S = -0.075$ ;  $\delta_d/\delta_s = 0.50$

$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$										$M = 0.95$	
-4	-0.5389	.1082	.0356	.0457	.0082	-4	-0.5523	.1390	.0858	.0491	.0095
-2	-0.4567	.0946	.0318	.0391	.0047	-2	-0.4168	.1183	.0718	.0382	.0078
0	-0.3471	.0882	.0255	.0282	.0047	0	-0.3230	.1058	.0565	.0277	.0066
2	-0.2503	.0837	.0145	.0188	.0045	2	-0.2188	.0975	.0411	.0175	.0061
4	-0.1553	.0828	.0052	.0088	.0047	4	-0.1146	.0923	.0222	.0062	.0061
6	-0.0274	.0855	.0057	-.0025	.0055	6	.0104	.0955	.0081	-.0054	.0068
8	.0913	.0991	.0170	-.0133	.0070	8	.01459	.1027	-.0070	-.0161	.0083
10	.1918	.1219	.0201	-.0211	.0092	10	.02918	.1287	-.0310	-.0289	.0112
12	.3197	.1519	.0248	-.0297	.0122	12	.04272	.1577	-.0476	-.0396	.0145
16	.5023	.2174	.0196	-.0408	.0180	16	.06419	.2293	-.0666	-.0541	.0210
20	.6668	.3065	.0204	-.0496	.0254	20	.07919	.3206	-.0771	-.0626	.0284
$M = 0.80$										$M = 1.00$	
-4	-0.5759	.1245	.0675	.0498	.0084	-4	-0.4780	.1329	.0710	.0442	.0095
-2	-0.4954	.1104	.0626	.0429	.0070	-2	-0.3784	.1130	.0547	.0341	.0076
0	-0.3715	.0950	.0670	.0308	.0054	0	-0.2529	.1031	.0345	.0218	.0066
2	-0.2724	.0888	.0391	.0214	.0050	2	-0.1693	.0982	.0229	.0128	.0063
4	-0.1573	.0826	.0227	.0102	.0051	4	-0.0498	.0962	.0058	.0020	.0064
6	-0.0372	.0857	.0078	-.0011	.0057	6	.0757	.1031	-.0106	-.0101	.0072
8	.1053	.0950	.0051	-.0131	.0074	8	.01693	.1081	-.0196	-.0188	.0088
10	.2415	.1196	.0133	-.0225	.0098	10	.03286	.1329	-.0432	-.0324	.0117
12	.3529	.1461	.0225	-.0316	.0127	12	.04680	.1656	-.0688	-.0447	.0152
16	.5635	.2170	.0297	-.0449	.0191	16	.06871	.2419	-.1040	-.0605	.0226
20	.7257	.2984	.0364	-.0534	.0261	20	.08663	.3411	-.1236	-.0720	.0308
$M = 0.85$										$M = 1.05$	
-4	-0.5794	.1292	.0466	.0502	.0091	-4	-0.4593	.1277	.0620	.0429	.0089
-2	-0.4867	.1090	.0703	.0421	.0072	-2	-0.3502	.1086	.0436	.0328	.0073
0	-0.3708	.0963	.0579	.0308	.0057	0	-0.2392	.0972	.0305	.0213	.0063
2	-0.2781	.0888	.0467	.0218	.0054	2	-0.1435	.0924	.0147	.0115	.0061
4	-0.1506	.0819	.0256	.0091	.0052	4	-0.0383	.0896	.0014	.0011	.0062
6	-0.0348	.0831	.0104	-.0020	.0056	6	.0670	.0943	-.0108	-.0095	.0069
8	.1159	.0963	.0021	-.0135	.0077	8	.02010	.1115	-.0277	-.0211	.0087
10	.2318	.1177	.0158	-.0232	.0100	10	.03349	.1353	-.0473	-.0333	.0114
12	.3940	.1494	.0238	-.0345	.0133	12	.04689	.1658	-.0718	-.0449	.0149
16	.6026	.2215	.0357	-.0480	.0199	16	.06890	.2420	-.1123	-.0618	.0221
20	.7370	.2988	.0450	-.0556	.0264	20	.08804	.3516	-.1442	-.0754	.0315
$M = 0.90$										$M = 1.10$	
-4	-0.5807	.1353	.0847	.0507	.0093	-4	-0.4471	.1187	.0581	.0419	.0084
-2	-0.4821	.1167	.0800	.0417	.0074	-2	-0.3326	.1021	.0437	.0315	.0067
0	-0.3725	.1026	.0708	.0317	.0061	0	-0.2310	.0938	.0284	.0206	.0059
2	-0.2739	.0916	.0563	.0221	.0054	2	-0.1386	.0892	.0137	.0112	.0056
4	-0.1424	.0862	.0328	.0096	.0054	4	-0.0370	.0819	.0014	.0008	.0057
6	-0.0219	.0895	.0135	-.0030	.0062	6	.0739	.0911	-.0135	-.0101	.0067
8	.1205	.1004	.0020	-.0141	.0080	8	.02125	.1049	-.0260	-.0214	.0084
10	.2630	.1222	.0166	-.0251	.0104	10	.03326	.1306	-.0472	-.0324	.0111
12	.4054	.1517	.0341	-.0364	.0137	12	.04527	.1601	-.0717	-.0440	.0141
16	.6136	.2226	.0500	-.0507	.0204	16	.06652	.2337	-.1084	-.0598	.0213
20	.7670	.3098	.0588	-.0589	.0273	20	.08499	.3468	-.1935	-.0736	.0303

TABLE V. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 0 - Continued

(c) Half-span spoiler slot deflector;  $\delta_s = -0.075$ ;  $\delta_d/\delta_s = 0.75$ 

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	
$M = 0.60$											$M = 0.95$	
-4	-5594	.1379	.0617	.0471	.0101	-4	-5228	.1624	.0717	.0457	.0109	
-2	-4769	.1242	.0522	.0393	.0079	-2	-4161	.1406	.0621	.0349	.0088	
0	-3742	.1151	.0530	.0298	.0059	0	-3137	.1270	.0532	.0251	.0078	
2	-2843	.1105	.0443	.0212	.0062	2	-2196	.1249	.0421	.0154	.0076	
4	-1926	.1105	.0391	.0118	.0059	4	-1255	.1156	.0295	.0054	.0074	
6	-0972	.1114	.0235	.0016	.0067	6	-0209	.1208	.0180	-.0045	.0082	
8	.0183	.1214	.0148	-.0086	.0079	8	.1025	.1312	.0126	-.0143	.0096	
10	.1376	.1023	.0133	-.0165	.0101	10	.2112	.1468	.0046	-.0227	.0115	
12	.2531	.1708	.0126	-.0243	.0126	12	.3283	.1718	-.0080	-.0319	.0143	
16	.4310	.2329	.0135	-.0353	.0179	16	.5541	.2405	-.0320	-.0480	.0210	
20	.6034	.3178	.0047	-.0437	.0251	20	.7214	.3290	-.0482	-.0573	.0282	
$M = 0.80$											$M = 1.00$	
-4	-5554	.1522	.0674	.0473	.0102	-4	-4899	.1633	.0636	.0431	.0107	
-2	-4461	.1312	.0592	.0372	.0083	-2	-3759	.1434	.0530	.0325	.0091	
0	-3479	.1200	.0558	.0282	.0068	0	-2699	.1324	.0392	.0236	.0083	
2	-2672	.1151	.0496	.0202	.0068	2	-1800	.1254	.0258	.0128	.0079	
4	-1677	.1101	.0379	.0098	.0065	4	-0700	.1244	.0137	.0021	.0079	
6	-0683	.1107	.0284	-.0002	.0072	6	.0300	.1264	.0022	-.0082	.0087	
8	.0224	.1225	.0216	-.0094	.0085	8	.1600	.1404	-.0111	-.0188	.0103	
10	.1566	.1380	.0191	-.0176	.0103	10	.2599	.1573	-.0207	-.0277	.0123	
12	.2734	.1646	.0169	-.0255	.0131	12	.3999	.1882	-.0368	-.0394	.0157	
16	.4722	.2264	.0096	-.0383	.0187	16	.5999	.2549	-.0628	-.0539	.0219	
20	.6461	.3106	.0080	-.0486	.0257	20	.7738	.3494	-.0857	-.0651	.0301	
$M = 0.85$											$M = 1.05$	
-4	-5463	.1516	.0668	.0463	.0106	-4	-4666	.1587	.0622	.0411	.0105	
-2	-4417	.1331	.0594	.0363	.0072	-2	-3553	.1396	.0510	.0312	.0088	
0	-3440	.1204	.0534	.0272	.0071	0	-2592	.1300	.0338	.0210	.0079	
2	-2673	.1146	.0463	.0194	.0069	2	-1632	.1243	.0214	.0117	.0078	
4	-1604	.1111	.0356	.0085	.0068	4	-0576	.1205	.0118	.0016	.0078	
6	-0535	.1111	.0273	-.0015	.0179	6	.0384	.1253	-.0016	-.0090	.0085	
8	.0581	.1227	.0225	-.0105	.0088	8	.1632	.1377	-.0148	-.0197	.0101	
10	.1627	.1354	.0184	-.0184	.0105	10	.2785	.1587	-.0323	-.0288	.0127	
12	.2906	.1643	.0148	-.0264	.0134	12	.4129	.1836	-.0454	-.0408	.0155	
16	.4765	.2245	.0028	-.0393	.0191	16	.6011	.2476	-.0486	-.0551	.0224	
20	.6625	.3102	.0159	-.0503	.0260	20	.7969	.3547	-.1127	-.0687	.0309	
$M = 0.90$											$M = 1.10$	
-4	-5319	.1554	.0702	.0455	.0105	-4	-4636	.1514	.0606	.0416	.0099	
-2	-4286	.1346	.0627	.0358	.0085	-2	-3524	.1302	.0466	.0314	.0087	
0	-3297	.1258	.0574	.0267	.0075	0	-2411	.1219	.0323	.0203	.0076	
2	-2528	.1160	.0493	.0181	.0070	2	-1576	.1163	.0197	.0111	.0074	
4	-1429	.1105	.0348	.0075	.0067	4	-0556	.1145	.0104	.0016	.0072	
6	-0374	.1160	.0261	-.0028	.0077	6	.0464	.1163	-.0007	-.0087	.0077	
8	.0769	.1248	.0203	-.0122	.0090	8	.1762	.1302	-.0128	-.0202	.0097	
10	.1868	.1423	.0144	-.0199	.0109	10	.2967	.1579	-.0291	-.0308	.0119	
12	.3077	.1696	.0062	-.0297	.0140	12	.4080	.1856	-.0452	-.0402	.0150	
16	.5055	.2309	.0092	-.0433	.0201	16	.5934	.2502	-.0723	-.0537	.0212	
20	.6704	.3130	.0259	-.0527	.0266	20	.7789	.3481	-.1102	-.0670	.0294	

TABLE V. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 0 - Concluded

(d) Half-span spoiler slot deflector;  $\delta_S = -0.075$ ;  $\delta_d/\delta_S = 1.00$

$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$										$M = 0.95$	
-4	-0.4532	0.1361	0.0453	0.0386	0.0112	-4	-0.4479	0.1605	0.0549	0.0390	0.0122
-2	-0.3651	0.1224	0.0492	0.0309	0.0094	-2	-0.3538	0.1449	0.0477	0.0303	0.0104
0	-0.2917	0.1178	0.0441	0.0236	0.0084	0	-0.2596	0.1355	0.0396	0.0206	0.0098
2	-0.2275	0.1178	0.0426	0.0165	0.0082	2	-0.1758	0.1292	0.0306	0.0124	0.0097
4	-0.1541	0.1133	0.0365	0.0080	0.0080	4	-0.0816	0.1271	0.0196	0.0029	0.0097
6	-0.0716	0.1169	0.0364	0.0000	0.0082	6	0.0230	0.1292	0.0126	-0.0072	0.0103
8	0.0257	0.1306	0.0319	-0.0085	0.0097	8	0.1214	0.1397	0.0053	-0.0157	0.0118
10	0.1119	0.1452	0.0342	-0.0141	0.0114	10	0.2323	0.1595	0.0030	-0.0233	0.0138
12	0.2037	0.1681	0.0382	-0.0198	0.0134	12	0.3056	0.1782	0.0095	-0.0287	0.0156
16	0.3596	0.2229	0.0451	-0.0283	0.0181	16	0.4731	0.2355	0.0054	-0.0394	0.0210
20	0.5137	0.2996	0.0408	-0.0364	0.0240	20	0.5819	0.2991	0.0038	-0.0452	0.0262
$M = 0.80$										$M = 1.00$	
-4	-0.4462	0.1479	0.0441	0.0386	0.0115	-4	-0.4283	0.1614	0.0505	0.0373	0.0124
-2	-0.3543	0.1324	0.0371	0.0302	0.0098	-2	-0.3283	0.1495	0.0429	0.0283	0.0110
0	-0.2660	0.1238	0.0364	0.0213	0.0086	0	-0.2322	0.1435	0.0342	0.0184	0.0103
2	-0.1951	0.1201	0.0329	0.0138	0.0087	2	-0.1581	0.1335	0.0260	0.0105	0.0100
4	-0.1044	0.1170	0.0244	0.0045	0.0086	4	-0.0681	0.1335	0.0139	0.0011	0.0100
6	-0.0199	0.1201	0.0223	-0.0039	0.0089	6	0.0420	0.1385	0.0035	-0.0090	0.0109
8	0.0758	0.1324	0.0224	-0.0117	0.0107	8	0.1521	0.1535	-0.0085	-0.0184	0.0128
10	0.1579	0.1461	0.0281	-0.0172	0.0123	10	0.2622	0.1734	-0.0157	-0.0274	0.0149
12	0.2436	0.1696	0.0337	-0.0229	0.0144	12	0.3523	0.1933	-0.0157	-0.0343	0.0174
16	0.3841	0.2160	0.0426	-0.0300	0.0185	16	0.5284	0.2531	-0.0259	-0.0466	0.0231
20	0.5482	0.2933	0.0329	-0.0398	0.0266	20	0.6725	0.3299	-0.0371	-0.0548	0.0293
$M = 0.85$										$M = 1.05$	
-4	-0.4465	0.1528	0.0445	0.0388	0.0119	-4	-0.4210	0.1637	0.0481	0.0370	0.0123
-2	-0.3535	0.1355	0.0377	0.0301	0.0101	-2	-0.3153	0.1474	0.0373	0.0267	0.0108
0	-0.2604	0.1268	0.0360	0.0211	0.0089	0	-0.2191	0.1397	0.0270	0.0168	0.0105
2	-0.1849	0.1216	0.0299	0.0131	0.0089	2	-0.1326	0.1369	0.0153	0.0077	0.0102
4	-0.0977	0.1181	0.0204	0.0038	0.0089	4	-0.0442	0.1330	0.0071	-0.0005	0.0102
6	-0.0070	0.1210	0.0199	-0.0050	0.0093	6	0.0500	0.1378	-0.0042	-0.0102	0.0109
8	0.0825	0.1326	0.0181	-0.0127	0.0110	8	0.1749	0.1522	-0.0143	-0.0206	0.0169
10	0.1697	0.1470	0.0221	-0.0185	0.0126	10	0.2807	0.1684	-0.0235	-0.0295	0.0148
12	0.2535	0.1673	0.0280	-0.0244	0.0147	12	0.3768	0.1943	-0.0315	-0.0374	0.0178
16	0.3907	0.2182	0.0386	-0.0314	0.0194	16	0.5498	0.2546	-0.0220	-0.0491	0.0240
20	0.5418	0.2825	0.0285	-0.0398	0.0253	20	0.7036	0.3378	-0.0671	-0.0593	0.0310
$M = 0.90$										$M = 1.10$	
-4	-0.4532	0.1566	0.0510	0.0410	0.0120	-4	-0.4158	0.1580	0.0487	0.0369	0.0115
-2	-0.3597	0.1402	0.0444	0.0309	0.0104	-2	-0.3137	0.1423	0.0363	0.0270	0.0104
0	-0.2629	0.1293	0.0397	0.0217	0.0093	0	-0.2209	0.1340	0.0237	0.0167	0.0100
2	-0.1848	0.1249	0.0321	0.0132	0.0092	2	-0.1281	0.1211	0.0140	0.0079	0.0097
4	-0.0869	0.1194	0.0199	0.0032	0.0090	4	-0.0446	0.1275	0.0049	-0.0003	0.0098
6	0.0044	0.1238	0.0161	-0.0060	0.0098	6	0.0575	0.1331	-0.0031	-0.0103	0.0103
8	0.1056	0.1325	0.0150	-0.0141	0.0114	8	0.1689	0.1451	-0.0140	-0.0199	0.0117
10	0.1936	0.1512	0.0170	-0.0207	0.0130	10	0.2803	0.1701	-0.0231	-0.0294	0.0138
12	0.2926	0.1742	0.0198	-0.0270	0.0154	12	0.3824	0.1941	-0.0335	-0.0378	0.0168
16	0.4246	0.2235	0.0270	-0.0344	0.0199	16	0.5402	0.2579	-0.0507	-0.0493	0.0224
20	0.5676	0.2947	0.0162	-0.0429	0.0255	20	0.6980	0.3429	-0.0690	-0.0591	0.0291

TABLE VI. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 0.25

## (a) Plain wing

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_i$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_i$	$C_n$
$M = 0.60$										$M = 0.95$	
$M = 0.80$										$M = 1.00$	
-4	-0.2912	.0136	.0232	.0323	.0018	-4	-0.3608	.0277	.0510	.0397	.0019
-2	-0.1711	.0082	.0090	.0179	.0015	-2	-0.2000	.0133	.0277	.0221	.0008
0	-0.0510	.0082	.0005	.0047	.0010	0	-0.0351	.0051	.0123	.0044	.0005
2	.0637	.0118	.0110	-.0086	.0008	2	.0887	.0082	-.0092	-.0106	.0010
4	.1820	.0208	.0177	-.0218	.0017	4	.2371	.0144	-.0255	-.0274	.0029
6	.3222	.0462	.0256	-.0369	.0050	6	.4021	.0339	-.0452	-.0436	.0059
8	.4587	.0752	.0203	-.0475	.0091	8	.5423	.0647	-.0605	-.0560	.0104
10	.5752	.1133	.0093	-.0561	.0133	10	.6268	.1027	-.0599	-.0618	.0141
12	.6607	.1550	.0058	-.0616	.0175	12	.7114	.1417	-.0492	-.0671	.0184
16	.8009	.2411	.0226	-.0695	.0258	16	.8351	.2217	-.0518	-.0750	.0259
20	.8828	.3326	.0240	-.0725	.0333	20	.8969	.3111	-.0511	-.0798	.0342
$M = 0.85$										$M = 1.05$	
-4	-0.3401	.0207	.0287	.0365	.0022	-4	-0.3212	.0310	.0702	.0372	.0022
-2	-0.1967	.0092	.0165	.0208	.0010	-2	-0.1795	.0179	.0411	.0202	.0009
0	-0.0393	.0046	.0064	.0040	.0006	0	-0.0189	.0122	.0041	.0024	.0004
2	.0810	.0069	.0048	-.0097	.0006	2	.1190	.0160	-.0212	-.0125	.0009
4	.2198	.0150	.0149	-.0244	.0026	4	.2456	.0245	-.0476	-.0283	.0022
6	.3702	.0346	.0274	-.0398	.0058	6	.3874	.0414	-.0755	-.0445	.0049
8	.4998	.0634	.0271	-.0505	.0095	8	.5196	.0687	-.0983	-.0591	.0088
10	.6016	.0991	.0184	-.0581	.0133	10	.6330	.1063	-.1076	-.0680	.0134
12	.6826	.1382	.0098	-.0630	.0174	12	.7369	.1486	-.1147	-.0760	.0180
16	.7867	.2166	.0107	-.0688	.0245	16	.9070	.2390	-.1263	-.0890	.0276
20	.8608	.3064	.0212	-.0729	.0322	20	.0393	.3584	-.1403	-.0987	.0393
$M = 0.90$										$M = 1.10$	
-4	-0.3593	.0249	.0335	.0382	.0023	-4	-0.3105	.0273	.0679	.0375	.0021
-2	-0.2025	.0098	.0172	.0214	.0010	-2	-0.1699	.0155	.0372	.0203	.0008
0	-0.0501	.0065	.0065	.0056	.0006	0	-0.0237	.0109	.0034	.0031	.0003
2	.0871	.0087	.0069	-.0103	.0010	2	.0913	.0118	-.0199	-.0103	.0008
4	.2265	.0163	.0190	-.0261	.0025	4	.2228	.0209	-.0475	-.0257	.0021
6	.3811	.0358	.0347	-.0420	.0056	6	.3744	.0391	-.0743	-.0429	.0047
8	.5139	.0651	.0351	-.0522	.0095	8	.5041	.0664	-.0961	-.0569	.0086
10	.6098	.1008	.0320	-.0597	.0133	10	.6174	.1009	-.1064	-.0657	.0129
12	.7078	.1410	.0268	-.0653	.0174	12	.7215	.1437	-.1158	-.0735	.0178
16	.7949	.2147	.0254	-.0703	.0244	16	.8859	.2355	-.1280	-.0866	.0271
20	.8820	.3068	.0299	-.0755	.0323	20	.0192	.3492	-.1400	-.0970	.0380

TABLE VI. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 0.25 - Continued

(b) Half-span spoiler slot deflector;  $\delta_S = -0.075c$ ;  $\delta_d/\delta_s = 0.50$

$\alpha_j$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha_j$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$										$M = 0.95$	
-4	-0.5216	0.1090	0.0124	0.0509	0.0083	-4	-0.5188	0.1286	0.0601	0.0524	0.0095
-2	-0.4304	0.0953	0.0073	0.0404	0.0063	-2	-0.4051	0.1080	0.0537	0.0427	0.0072
0	-0.3028	0.0863	0.0029	0.0283	0.0050	0	-0.2914	0.0926	0.0415	0.0294	0.0061
2	-0.2024	0.0863	0.0042	0.0173	0.0048	2	-0.1881	0.0875	0.0293	0.0177	0.0057
4	-0.0930	0.0863	0.0163	0.0052	0.0052	4	-0.0641	0.0823	0.0153	0.0046	0.0053
6	0.0401	0.0908	0.0242	-0.0087	0.0057	6	0.0599	0.0854	-0.0033	-0.0090	0.0061
8	0.1714	0.1090	0.0362	-0.0225	0.0083	8	0.2046	0.1029	-0.0208	-0.0234	0.0088
10	0.2991	0.1353	0.0328	-0.026	0.0117	10	0.3389	0.1266	-0.0389	-0.0361	0.0123
12	0.4359	0.1707	0.0248	-0.0425	0.0157	12	0.4733	0.1564	-0.0358	-0.0460	0.0157
16	0.6000	0.2388	0.0026	-0.0520	0.0223	16	0.6800	0.2315	-0.0340	-0.0612	0.0229
20	0.7642	0.3269	0.0196	-0.0611	0.0307	20	0.8040	0.3169	-0.0343	-0.0697	0.0307
$M = 0.80$										$M = 1.00$	
-4	-0.5598	0.1205	0.0300	0.0544	0.0088	-4	-0.4855	0.1277	0.0622	0.0509	0.0093
-2	-0.4481	0.0989	0.0238	0.0429	0.0066	-2	-0.3671	0.1081	0.0476	0.0470	0.0073
0	-0.3178	0.0853	0.0153	0.0295	0.0051	0	-0.2487	0.0983	0.0315	0.0255	0.0066
2	-0.2085	0.0803	0.0067	0.0181	0.0051	2	-0.1401	0.0934	0.0159	0.0137	0.0061
4	-0.0943	0.0773	0.0053	0.0053	0.0051	4	-0.0414	0.0865	-0.0022	0.0010	0.0062
6	0.0335	0.0803	0.0152	-0.0083	0.0057	6	0.1026	0.0914	-0.0178	-0.0125	0.0070
8	0.1850	0.0989	0.0243	-0.0223	0.0084	8	0.2349	0.1101	-0.0407	-0.0277	0.0095
10	0.3153	0.1267	0.0265	-0.0338	0.0118	10	0.3928	0.1327	-0.0635	-0.0429	0.0133
12	0.4332	0.1564	0.0221	-0.0423	0.0152	12	0.5309	0.1671	-0.0806	-0.0556	0.0174
16	0.6008	0.2244	0.0026	-0.0527	0.0217	16	0.6987	0.2358	-0.0686	-0.0666	0.0242
20	0.7672	0.3127	0.0068	-0.0625	0.0299	20	0.8664	0.3341	-0.0709	-0.0776	0.0334
$M = 0.85$										$M = 1.05$	
-4	-0.5590	0.1212	0.0355	0.0538	0.0090	-4	-0.4662	0.1227	0.0578	0.0497	0.0086
-2	-0.4476	0.1016	0.0304	0.0439	0.0069	-2	-0.3374	0.1057	0.0409	0.0362	0.0068
0	-0.3270	0.0866	0.0210	0.0306	0.0053	0	-0.2388	0.0944	0.0221	0.0099	0.0132
2	-0.2111	0.0831	0.0140	0.0185	0.0053	2	-0.1194	0.0896	0.0090	0.0115	0.0057
4	-0.0951	0.0808	0.0000	0.0058	0.0053	4	-0.0152	0.0868	-0.0057	-0.0005	0.0060
6	0.0441	0.0808	0.0100	-0.0083	0.0058	6	0.1023	0.0915	-0.0240	-0.0136	0.0066
8	0.1902	0.1016	0.0227	-0.0220	0.0085	8	0.2445	0.1066	-0.0463	-0.0282	0.0092
10	0.3108	0.1259	0.0260	-0.0330	0.0117	10	0.3961	0.1321	-0.0700	-0.0437	0.0130
12	0.4569	0.1582	0.0179	-0.0435	0.0156	12	0.5288	0.1651	-0.0905	-0.0566	0.0173
16	0.6239	0.2252	0.0063	-0.0536	0.0219	16	0.7183	0.2387	-0.0986	-0.0714	0.0251
20	0.7700	0.3118	0.0058	-0.0638	0.0303	20	0.8889	0.3444	-0.0970	-0.0841	0.0346
$M = 0.90$										$M = 1.10$	
-4	-0.5586	0.1282	0.0492	0.0553	0.0095	-4	-0.4507	0.1186	0.0559	0.0480	0.0080
-2	-0.4495	0.1086	0.0431	0.0450	0.0072	-2	-0.3316	0.1003	0.0384	0.0355	0.0063
0	-0.3295	0.0923	0.0300	0.0310	0.0056	0	-0.2217	0.0876	0.0216	0.0221	0.0063
2	-0.2204	0.0869	0.0239	0.0196	0.0055	2	-0.1209	0.0867	0.0092	0.0119	0.0055
4	-0.1004	0.0815	0.0058	0.0064	0.0054	4	-0.0110	0.0821	-0.0040	-0.0006	0.0056
6	0.0415	0.0847	0.0075	-0.0086	0.0060	6	0.1081	0.0894	-0.0187	0.0019	0.0064
8	0.1833	0.1032	0.0201	-0.0219	0.0085	8	0.2363	0.1049	-0.0423	-0.0273	0.0088
10	0.3251	0.1249	0.0278	-0.0342	0.0119	10	0.3792	0.1277	-0.0685	-0.0427	0.0124
12	0.4561	0.1575	0.0238	-0.0445	0.0153	12	0.5112	0.1596	-0.0882	-0.0552	0.0166
16	0.6415	0.2281	0.0159	-0.0566	0.0224	16	0.7035	0.2353	-0.0989	-0.0704	0.0343
20	0.7724	0.3151	0.0148	-0.0650	0.0302	20	0.8684	0.3329	-0.1192	-0.0828	0.0344

TABLE VI. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 0.25 - Continued

(c) Half-span spoiler slot deflector;  $\delta_s = -0.075c$ ;  $\delta_d/\delta_s = 0.75$

$\alpha_s$ deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$	$\alpha_s$ deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$						
<b>M = 0.60</b>																	
-4	-0.5145	0.1208	0.0252	0.0496	0.0084	-4	-0.4999	0.1400	0.0435	0.0489	0.0095						
-2	-0.4134	0.1061	0.0210	0.0398	0.0064	-2	-0.3853	0.1161	0.0332	0.0376	0.0071						
0	-0.3068	0.0961	0.0144	0.0272	0.0054	0	-0.2812	0.1089	0.0271	0.0260	0.0066						
2	-0.2297	0.0961	0.0079	0.0184	0.0054	2	-0.1979	0.1016	0.0195	0.0162	0.0065						
4	-0.1286	0.0951	0.0036	0.0076	0.0057	4	-0.0854	0.0954	0.0094	0.0041	0.0063						
6	-0.0239	0.0961	0.0032	-0.0042	0.0057	6	0.0312	0.0985	0.0041	-0.0084	0.0066						
8	0.1011	0.1601	0.0095	-0.0168	0.0076	8	0.1562	0.1130	-0.0023	-0.0200	0.0089						
10	0.2113	0.1345	0.0096	-0.0260	0.0101	10	0.2708	0.1338	-0.0069	-0.0289	0.0119						
12	0.3215	0.1628	0.0021	-0.0348	0.0134	12	0.3957	0.1607	-0.0071	-0.0403	0.0153						
16	0.4869	0.2250	0.0278	-0.0436	0.0198	16	0.5707	0.2209	-0.0048	-0.0530	0.0219						
20	0.6486	0.3101	0.0394	-0.0530	0.0277	20	0.7186	0.3038	-0.0128	-0.0637	0.0300						
<b>M = 0.80</b>																	
-4	-0.5315	0.1351	0.0338	0.0507	0.0086	<b>M = 1.00</b>											
-2	-0.4127	0.1121	0.0290	0.0405	0.0063	-4	-0.4772	0.1396	0.0520	0.0482	0.0096						
0	-0.3089	0.1015	0.0202	0.0273	0.0056	-2	-0.3519	0.1237	0.0380	0.0354	0.0078						
2	-0.2126	0.0965	0.0178	0.0169	0.0056	0	-0.2426	0.1109	0.0271	0.0228	0.0074						
4	-0.1063	0.0909	0.0088	0.0059	0.0057	2	-0.1591	0.1039	0.0137	0.0124	0.0073						
6	0.0000	0.0934	0.0050	-0.0056	0.0059	4	-0.0517	0.1020	0.0018	0.0005	0.0071						
8	0.1251	0.1090	0.0033	-0.0173	0.0081	6	0.0597	0.1039	-0.0035	-0.0109	0.0074						
10	0.2314	0.1289	0.0021	-0.0270	0.0107	8	0.1690	0.1188	-0.0159	-0.0226	0.0096						
12	0.3564	0.1588	0.0051	-0.0364	0.0146	10	0.3082	0.1386	-0.0332	-0.0361	0.0129						
16	0.5040	0.2117	0.0272	-0.0445	0.0200	12	0.4275	0.1663	-0.0413	-0.0463	0.0165						
20	0.6603	0.2939	0.0262	-0.0555	0.0277	16	0.6045	0.2277	-0.0339	-0.0582	0.0227						
<b>M = 0.85</b>																	
-4	-0.5142	0.1332	0.0362	0.0496	0.0089	<b>M = 1.05</b>											
-2	-0.4114	0.1135	0.0301	0.0392	0.0066	-4	-0.4525	0.1340	0.0489	0.0466	0.0087						
0	-0.3039	0.1018	0.0214	0.0268	0.0057	-2	-0.3532	0.1160	0.0319	0.0350	0.0074						
2	-0.2174	0.0978	0.0166	0.0174	0.0056	0	-0.2387	0.1055	0.0209	0.0217	0.0071						
4	-0.1099	0.0931	0.0061	0.0054	0.0058	2	-0.1375	0.0998	0.0104	0.0111	0.0070						
6	0.0023	0.0931	0.0019	-0.0064	0.0061	4	-0.0382	0.0998	-0.0004	0.0002	0.0070						
8	0.1332	0.1076	0.0051	-0.0194	0.0085	6	0.0573	0.1046	-0.0115	-0.0118	0.0072						
10	0.2454	0.1280	0.0019	-0.0278	0.0112	8	0.1814	0.1188	-0.0255	-0.0244	0.0093						
12	0.3506	0.1542	0.0017	-0.0370	0.0149	10	0.3246	0.1388	-0.0427	-0.0401	0.0126						
16	0.5142	0.2118	0.0244	-0.0456	0.0205	12	0.4487	0.1673	-0.0540	-0.0500	0.0162						
20	0.6591	0.2874	0.0185	-0.0564	0.0280	16	0.6301	0.2329	-0.0649	-0.0641	0.0237						
<b>M = 0.90</b>																	
-4	-0.5058	0.1369	0.0363	0.0486	0.0090	<b>M = 1.10</b>											
-2	-0.4024	0.1161	0.0285	0.0382	0.0069	-4	-0.4430	0.1250	0.0453	0.0452	0.0084						
0	-0.2969	0.1062	0.0201	0.0260	0.0058	-2	-0.3322	0.1103	0.0315	0.0337	0.0070						
2	-0.2045	0.1018	0.0157	0.0164	0.0060	0	-0.2307	0.1011	0.0187	0.0210	0.0067						
4	-0.0924	0.0931	0.0044	0.0043	0.0060	2	-0.1384	0.0965	0.0089	0.0103	0.0064						
6	0.0264	0.0963	0.0043	-0.0079	0.0063	4	-0.0461	0.0928	-0.0011	0.0002	0.0063						
8	0.1473	0.1117	0.0042	-0.0205	0.0085	6	0.0738	0.0974	-0.0087	-0.0122	0.0070						
10	0.2639	0.1336	0.0033	-0.0296	0.0116	8	0.1938	0.1149	-0.0222	-0.0256	0.0090						
12	0.3650	0.1577	0.006	-0.0377	0.0146	10	0.3230	0.1360	-0.0403	-0.0382	0.0122						
16	0.5388	0.2157	0.0146	-0.0488	0.0206	12	0.4337	0.1167	-0.0529	-0.0484	0.0156						
20	0.6707	0.2923	0.0088	-0.0586	0.0279	16	0.6091	0.2297	-0.0655	-0.0624	0.0231						

TABLE VI. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 0.25 - Concluded

(d) Half-span spoiler slot deflector;  $\delta_s = -0.075c$ ;  $\delta_d/\delta_s = 1.00$

$\alpha_i$ deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$	$\alpha_i$ deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$
$M = 0.60$						$M = 0.95$					
$M = 0.80$						$M = 1.00$					
-4	-0.4466	0.1318	0.0178	0.0428	0.0097	-4	-0.4228	0.1462	0.0259	0.0423	0.0105
-2	-0.3455	0.1199	0.0125	0.0323	0.0081	-2	-0.3187	0.1307	0.0145	0.0316	0.0088
0	-0.2481	0.1135	0.0033	0.0212	0.0077	0	-0.2145	0.1213	0.0094	0.0194	0.0084
2	-0.1709	0.1107	0.0027	0.0124	0.0077	2	-0.1375	0.1213	0.0010	0.0102	0.0086
4	-0.0698	0.1107	0.0003	0.0019	0.0072	4	-0.0271	0.1130	-0.0049	-0.0014	0.0080
6	0.0147	0.1153	0.0073	-0.0087	0.0074	6	0.0771	0.1203	-0.0094	-0.0134	0.0088
8	0.1231	0.1336	0.0146	-0.0201	0.0092	8	0.1916	0.1358	-0.0147	-0.0250	0.0113
10	0.2150	0.1565	0.0048	-0.0271	0.0116	10	0.2853	0.1555	-0.0121	-0.0326	0.0141
12	0.3069	0.1794	0.0051	-0.0338	0.0144	12	0.3895	0.1804	-0.0069	-0.0410	0.0175
16	0.4301	0.2379	0.0438	-0.0398	0.0196	16	0.5207	0.2344	0.0093	-0.0496	0.0228
20	0.5734	0.3120	0.0576	-0.0469	0.0267	20	0.6186	0.3018	0.0210	-0.0549	0.0293
$M = 0.85$						$M = 1.05$					
-4	-0.4352	0.1438	0.0186	0.0427	0.0099	-4	-0.4036	0.1495	0.0278	0.0412	0.0107
-2	-0.3351	0.1283	0.0092	0.0323	0.0080	-2	-0.2943	0.1346	0.0155	0.0291	0.0093
0	-0.2289	0.1189	0.0042	0.0195	0.0072	0	-0.1949	0.1267	0.0062	0.0177	0.0090
2	-0.1476	0.1171	0.0029	0.0109	0.0073	2	-0.1054	0.1198	-0.0034	0.0247	0.0087
4	-0.0538	0.1127	0.0034	0.0001	0.0074	4	-0.0139	0.1198	-0.0139	-0.0039	0.0087
6	0.0463	0.1183	0.0074	-0.0110	0.0078	6	0.0895	0.1277	-0.0199	-0.0155	0.0094
8	0.2213	0.1326	0.0049	-0.0217	0.0101	8	0.2028	0.1435	-0.0347	-0.0278	0.0121
10	0.2589	0.1544	0.0025	-0.0299	0.0128	10	0.3122	0.1614	-0.0384	-0.0380	0.0153
12	0.3589	0.1793	0.0081	-0.0367	0.0162	12	0.4016	0.1861	-0.0304	-0.0456	0.0184
16	0.4690	0.2329	0.0407	-0.0426	0.0210	16	0.5508	0.2435	-0.0123	-0.0541	0.0239
20	0.5840	0.3001	0.0471	-0.0495	0.0274	20	0.6900	0.3227	-0.0135	-0.0632	0.0314
$M = 0.90$						$M = 1.10$					
-4	-0.4371	0.1455	0.0199	0.0432	0.0105	-4	-0.3971	0.1483	0.0243	0.0404	0.0105
-2	-0.3249	0.1286	0.0111	0.0312	0.0081	-2	-0.2921	0.1340	0.0108	0.0281	0.0090
0	-0.2256	0.1204	0.0054	0.0197	0.0073	0	-0.1776	0.1274	0.0044	0.0155	0.0087
2	-0.1437	0.1170	0.0017	0.0107	0.0075	2	-0.0916	0.1217	-0.0063	0.0060	0.0084
4	-0.0444	0.1152	0.0062	-0.0008	0.0076	4	-0.0057	0.1198	-0.0140	-0.0046	0.0085
6	0.0549	0.1193	0.0090	-0.0118	0.0081	6	0.0993	0.1283	-0.0205	-0.0160	0.0090
8	0.1659	0.1309	0.0134	-0.0231	0.0105	8	0.2138	0.1416	-0.0308	-0.0283	0.0113
10	0.2711	0.1548	0.0049	-0.0308	0.0131	10	0.3284	0.1626	-0.0428	-0.0397	0.0147
12	0.3705	0.1810	0.0057	-0.0379	0.0164	12	0.4239	0.1882	-0.0487	-0.0487	0.0185
16	0.4815	0.2333	0.0352	-0.0438	0.0214	16	0.5862	0.2481	-0.0425	-0.0602	0.0251
20	0.5773	0.2944	0.0412	-0.0500	0.0222	20	0.7103	0.3308	-0.0489	-0.0698	0.0330

TABLE VII. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 0.5

## (a) Plain wing

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$						$M = 0.95$					
-4	-0.2435	.0128	.0095	.0314	.0010	-4	-0.2608	.0170	.0150	.0346	.0010
-2	-0.1428	.0109	.0012	.0185	.0005	-2	-0.1511	.0098	.0101	.0177	.0005
0	-0.0238	.0119	.0011	.0038	.0002	0	-0.0166	.0067	.0053	.0030	.0000
2	.0732	.0146	.0053	-0.0085	.0003	2	.0973	.0082	-0.0025	-0.0106	.0008
4	.1849	.0237	.0062	-0.0220	.0012	4	.2277	.0144	-0.0079	-0.0257	.0023
6	.3205	.0474	.0132	-0.0376	.0044	6	.3664	.0294	-0.0226	-0.0417	.0048
8	.4615	.0784	.0080	-0.0502	.0085	8	.5071	.0567	-0.0333	-0.0549	.0094
10	.5768	.1158	.0036	-0.0593	.0136	10	.6086	.0917	-0.0282	-0.0620	.0133
12	.6666	.1586	.0277	-0.0649	.0179	12	.6976	.1304	-0.0177	-0.0691	.0172
16	.8002	.2425	.0528	-0.0724	.0264	16	.7969	.2025	-0.0044	-0.0753	.0245
20	.8698	.3346	.0590	-0.0753	.0345	20	.8528	.2813	-0.0073	-0.0789	.0322
$M = 0.80$						$M = 1.00$					
-4	-0.2834	.0173	.0084	.0113	.0012	-4	-0.2470	.0177	.0385	.0355	.0010
-2	-0.1529	.0099	.0010	.0181	.0003	-2	-0.1264	.0138	.0259	.0186	.0005
0	-0.0286	.0068	.0008	.0036	.0001	0	-0.0138	.0069	.0088	.0030	.0001
2	.0845	.0087	.0036	-0.0096	.0005	2	.0929	.0113	-0.0057	-0.0102	.0008
4	.2038	.0173	.0204	-0.0230	.0024	4	.2312	.0162	-0.0190	-0.0257	.0023
6	.3480	.0390	.0113	-0.0394	.0057	6	.3695	.0310	-0.0363	-0.0426	.0045
8	.4810	.0606	.0083	-0.0511	.0098	8	.4979	.0556	-0.0563	-0.0570	.0087
10	.5929	.0947	.0048	-0.0596	.0141	10	.5868	.0856	-0.0466	-0.0626	.0125
12	.6787	.1324	.0223	-0.0653	.0183	12	.6955	.1249	-0.0568	-0.0727	.0172
16	.7781	.2092	.0352	-0.0707	.0254	16	.8397	.2066	-0.0467	-0.0829	.0258
20	.8328	.2587	.0305	-0.0734	.0323	20	.9365	.3000	-0.0323	-0.0880	.0344
$M = 0.85$						$M = 1.05$					
-4	-0.2765	.0162	.0073	.0328	.0012	-4	-0.2427	.0217	.0465	.0341	.0012
-2	-0.1487	.0098	.0041	.0179	.0004	-2	-0.1384	.0161	.0276	.0179	.0004
0	-0.0267	.0058	.0020	.0036	.0001	0	-0.0209	.0113	.0060	.0032	.0001
2	.0836	.0081	.0050	-0.0099	.0004	2	.0891	.0113	-0.0121	-0.0106	.0005
4	.2172	.0150	.0009	-0.0239	.0022	4	.1991	.0170	-0.0288	-0.0235	.0022
6	.3450	.0312	.0149	-0.0398	.0053	6	.3319	.0312	-0.0506	-0.0406	.0042
8	.4902	.0596	.0096	-0.0521	.0096	8	.4684	.0500	-0.0719	-0.0568	.0079
10	.5925	.0914	.0018	-0.0601	.0134	10	.5822	.0793	-0.0779	-0.0674	.0120
12	.6715	.1290	.0152	-0.0651	.0174	12	.6865	.1190	-0.0845	-0.0755	.0172
16	.7714	.2036	.0259	-0.0708	.0245	16	.8306	.1964	-0.0806	-0.0851	.0259
20	.8295	.2851	.0223	-0.0740	.0315	20	.9558	.2993	-0.0910	-0.0958	.0369
$M = 0.90$						$M = 1.10$					
-4	-0.2885	.0212	.0097	.0337	.0012	-4	-0.2435	.0210	.0453	.0337	.0011
-2	-0.1595	.0120	.0027	.0182	.0004	-2	-0.1355	.0155	.0244	.0172	.0004
0	-0.0262	.0071	.0021	.0034	.0001	0	-0.0146	.0100	.0035	.0016	.0000
2	.0984	.0087	.0001	-0.0103	.0007	2	.0861	.0119	-0.0129	-0.0102	.0004
4	.2229	.0152	.0019	-0.0247	.0022	4	.1868	.0173	-0.0306	-0.0235	.0022
6	.3672	.0316	.0151	-0.0415	.0052	6	.3204	.0301	-0.0482	-0.0392	.0037
8	.4961	.0598	.0207	-0.0543	.0092	8	.4486	.0501	-0.0692	-0.0541	.0069
10	.6054	.0941	.0075	-0.0618	.0131	10	.5621	.0757	-0.0847	-0.0659	.0110
12	.6819	.1306	.0103	-0.0659	.0169	12	.6628	.1158	-0.0840	-0.0737	.0154
16	.7737	.2029	.0152	-0.0721	.0241	16	.8185	.1960	-0.0928	-0.0862	.0256
20	.8349	.2807	.0086	-0.0762	.0316	20	.9558	.2972	-0.1011	-0.0972	.0369

TABLE VII. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 0.5 - Continued

(b) Half-span spoiler slot deflector;  $\delta_S = -0.075c$ ;  $\delta_d/\delta_S = 0.50$

$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha_s$ deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$										$M = 0.95$	
-4	-•4907	.0845	.0115	.0509	.0083	-4	-•4780	.1018	.0353	.0504	.0081
-2	-•3763	.0726	.0036	.0390	.0059	-2	-•3736	.0842	.0209	.0388	.0058
0	-•2564	.0716	.0060	.0248	.0044	0	-•2484	.0707	.0166	.0250	.0048
2	-•1642	.0707	.0031	.0150	.0044	2	-•1440	.0707	.0166	.0138	.0048
4	-•0627	.0716	.0009	.0032	.0047	4	-•0501	.0655	.0112	.0021	.0048
6	.0480	.0790	.0040	-•0100	.0051	6	.0751	.0707	.0123	-•0104	.0053
8	.1863	.0992	.0084	-•0250	.0076	8	.2004	.0863	.0014	-•0238	.0081
10	.3062	.1277	.0023	-•0352	.0115	10	.3256	.1070	-•0030	-•0363	.0113
12	.4354	.1635	.0118	-•0455	.0157	12	.4300	.1330	.0079	-•0443	.0146
16	.5959	.2315	.0510	-•0550	.0228	16	.6179	.1985	.0182	-•0586	.0215
20	.7231	.3150	.0692	-•0637	.0312	20	.7431	.2785	.0122	-•0693	.0304
$M = 0.80$										$M = 1.00$	
-4	-•5123	.0954	.0173	.0530	.0082	-4	-•4362	.1002	.0384	.0486	.0077
-2	-•3871	.0780	.0107	.0397	.0055	-2	-•3326	.0863	.0331	.0367	.0064
0	-•2706	.0705	.0047	.0262	.0046	0	-•2271	.0773	.0277	.0234	.0056
2	-•1616	.0642	.0050	.0144	.0046	2	-•1175	.0724	.0188	.0106	.0053
4	-•0551	.0636	.0053	.0026	.0046	4	-•0279	.0674	.0137	.0003	.0053
6	.0664	.0705	.0067	-•0107	.0052	6	.0817	.0734	.0086	-•0111	.0059
8	.1954	.0892	.0036	-•0247	.0079	8	.2111	.0873	-•0056	-•0261	.0086
10	.3269	.1172	.0004	-•0360	.0114	10	.3406	.1081	-•0190	-•0389	.0118
12	.4334	.1422	.0162	-•0440	.0146	12	.4601	.1368	-•0157	-•0483	.0155
16	.5962	.2083	.0450	-•0543	.0215	16	.6294	.1963	-•0006	-•0611	.0221
20	.7165	.2869	.0522	-•0635	.0294	20	.7648	.2836	-•0132	-•0730	.0314
$M = 0.85$										$M = 1.05$	
-4	-•5128	.0979	.0211	.0515	.0080	-4	-•4091	.0933	.0333	.0453	.0065
-2	-•3934	.0799	.0112	.0401	.0056	-2	-•2982	.0790	.0257	.0326	.0051
0	-•2693	.0717	.0463	.0261	.0047	0	-•1893	.0695	.0194	.0200	.0039
2	-•1616	.0659	.0064	.0144	.0044	2	-•0975	.0657	.0071	.0090	-•0045
4	-•0445	.0641	.0101	.0024	.0045	4	-•0038	.0666	-•0002	-•0021	.0003
6	.0726	.0688	.0079	-•0106	.0053	6	.1071	.0733	-•0063	-•0152	.0017
8	.1897	.0863	.0023	-•0247	.0080	8	.2409	.0885	-•0148	-•0283	.0053
10	.3231	.1107	.0002	-•0367	.0116	10	.3460	.1066	-•0337	-•0406	.0114
12	.4355	.1399	.0171	-•0447	.0147	12	.4607	.1352	-•0435	-•0521	.0148
16	.5877	.2028	.0407	-•0541	.0213	16	.6423	.1970	-•0507	-•0676	.0223
20	.7165	.2809	.0416	-•0648	.0298	20	.7914	.2817	-•0545	-•0805	.0319
$M = 0.90$										$M = 1.10$	
-4	-•5157	.1021	.0281	.0532	.0081	-4	-•3951	.0855	.0342	.0438	.0059
-2	-•4055	.0856	.0166	.0410	.0057	-2	-•2936	.0754	.0275	.0327	.0133
0	-•2711	.0746	.0125	.0264	.0046	0	-•1828	.0671	.0235	.0196	.0051
2	-•1631	.0691	.0120	.0155	.0045	2	-•0997	.0625	.0109	.0090	.0044
4	-•0419	.0636	.0115	.0023	.0045	4	-•0074	.0625	.0014	-•0021	.0046
6	.0683	.0691	.0094	-•0109	.0052	6	.1034	.0708	-•0032	-•0145	.0051
8	.2006	.0856	.0003	-•0245	.0079	8	.2234	.0864	-•0159	-•0281	.0074
10	.3218	.1075	.0029	-•0359	.0114	10	.3434	.1066	-•0324	-•0408	.0108
12	.4320	.1350	.0144	-•0440	.0145	12	.4450	.1351	-•0463	-•0515	.0143
16	.5973	.1975	.0309	-•0562	.0212	16	.6296	.1967	-•0564	-•0677	.0222
20	.7295	.2831	.0284	-•0666	.0300	20	.7866	.2841	-•0698	-•0810	.0322

TABLE VII.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 0.5 - Continued

(c) Half-span spoiler slot deflector;  $\delta_S = -0.075c$ ;  $\delta_d/\delta_S = 0.75$

$\alpha_s$ deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$	$\alpha_s$ deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$
$M = 0.60$											$M = 0.95$
$M = 0.80$											$M = 1.00$
-4	-0.4925	.1001	.0048	.0513	.0078	-4	-0.4634	.1133	.0208	.0492	.0082
-2	-0.3911	.0863	.0070	.0396	.0057	-2	-0.3590	.0977	.0065	.0368	.0057
0	-0.2804	.0817	.0065	.0262	.0047	0	-0.2484	.0873	.0066	.0241	.0052
2	-0.1882	.0817	.0087	.0156	.0049	2	-0.1566	.0811	.0053	.0139	.0052
4	-0.0849	.0817	.0011	.0044	.0049	4	-0.0459	.0790	.0069	.0014	.0053
6	.0111	.0863	.0034	-0.0073	.0054	6	.0689	.0821	.0058	-0.0111	.0059
8	.1586	.1047	.0053	-0.0227	.0076	8	.1837	.0977	-0.0006	-0.0236	.0086
10	.2638	.1323	.0008	-0.0322	.0108	10	.3048	.1154	-0.0006	-0.0345	.0120
12	.3745	.1681	.0081	-0.0414	.0148	12	.3924	.1393	.0130	-0.0409	.0150
16	.5313	.2351	.0475	-0.0502	.0216	16	.5594	.1964	.0291	-0.0534	.0213
20	.6696	.3150	.0673	-0.0596	.0300	20	.6951	.2744	.0164	-0.0652	.0299
$M = 0.85$											$M = 1.05$
-4	-0.4909	.1097	.0048	.0502	.0080	-4	-0.4423	.1141	.0267	.0474	.0175
-2	-0.3782	.0923	.0037	.0374	.0056	-2	-0.3347	.0982	.0210	.0355	.0066
0	-0.2655	.0835	.0027	.0250	.0049	0	-0.2311	.0883	.0175	.0229	.0063
2	-0.1803	.0804	.0033	.0149	.0050	2	-0.1355	.0804	.0151	.0128	.0064
4	-0.0714	.0773	.0008	.0030	.0050	4	-0.0398	.0804	.0066	.0009	.0058
6	.0413	.0804	.0005	-0.0092	.0055	6	.0757	.0863	.0071	-0.0113	.0066
8	.1665	.0979	.0025	-0.0227	.0078	8	.1753	.0962	.0020	-0.0225	.0086
10	.2855	.1209	.0004	-0.0329	.0117	10	.3048	.1647	-0.0173	-0.0362	.0121
12	.3982	.1490	.0152	-0.0416	.0153	12	.4144	.1419	-0.0158	-0.0461	.0154
16	.5309	.2082	.0502	-0.0490	.0212	16	.5738	.1974	.0044	-0.0572	.0218
20	.6637	.2843	.0537	-0.0594	.0289	20	.7233	.2768	-0.0115	-0.0705	.0308
$M = 0.90$											$M = 1.10$
-4	-0.4847	.1131	.0086	.0499	.0079	-4	-0.4150	.1123	.0306	.0455	.0079
-2	-0.3676	.0938	.0007	.0373	.0057	-2	-0.3289	.0962	.0191	.0339	.0065
0	-0.2505	.0839	.0015	.0243	.0050	0	-0.2142	.0895	.0170	.0215	.0061
2	-0.1709	.0810	.0014	.0146	.0051	2	-0.1281	.0847	.0082	.0106	.0059
4	-0.0632	.0764	.0010	.0026	.0051	4	-0.0325	.0800	.0056	.0005	.0058
6	.0421	.0810	.0003	-0.0094	.0057	6	.0631	.0847	-0.0001	-0.0110	.0066
8	.1709	.0956	.0012	-0.0225	.0079	8	.1874	.0971	-0.0090	-0.0244	.0087
10	.2950	.1201	.0001	-0.0335	.0121	10	.3117	.1181	-0.0283	-0.0388	.0122
12	.3887	.1434	.0147	-0.0407	.0205	12	.4169	.1409	-0.0369	-0.0491	.0157
16	.5338	.2034	.0467	-0.0501	.0212	16	.5890	.1990	-0.0323	-0.0629	.0228
20	.6603	.2792	.0465	-0.0595	.0289	20	.7515	.2799	-0.0418	-0.0763	.0322

TABLE VII. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH

SWEEP OF 45° AND TAPER RATIO OF 0.5 - Concluded

(d) Half-span spoiler slot deflector;  $\delta_s = -0.075c$ ;  $\delta_d/\delta_s = 1.00$ 

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$		$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$											$M = 0.95$	
-4	-4283	.1057	.0124	.0430	.0089		-4	-3907	.1222	-.0053	.0412	.0092
-2	-3175	.0937	.0239	.0308	.0073		-2	-2758	.1066	-.0138	.0277	.0071
0	-2252	.0919	.0173	.0199	.0067		0	-1818	.0988	-.0089	.0170	.0071
2	-1606	.0919	.0166	.0119	.0067		2	-0982	.0936	-.0059	.0081	.0070
4	-0701	.0919	.0108	.0019	.0067		4	-0146	.0947	-.0055	-.0025	.0069
6	.0185	.0983	.0103	-.0090	.0069		6	.0898	.0988	-.0038	-.0134	.0074
8	.1348	.1149	.0164	.0220	.0088		8	.2048	.1404	-.0034	-.0256	.0098
10	.2455	.1397	.0104	-.0311	.0118		10	.2988	.1332	-.0096	-.0358	.0134
12	.3470	.1673	.0058	-.0394	.0193		12	.3928	.1560	.0114	-.0417	.0162
16	.4578	.2224	.0434	-.0450	.0211		16	.5182	.2107	-.0287	-.0519	.0225
20	.5778	.2941	.0717	-.0522	.0283		20	.6227	.2757	.0364	-.0592	.0293
$M = 0.80$											$M = 1.00$	
-4	-4050	.1155	.0065	.0416	.0087		-4	-3649	.1221	.0018	.0388	.0091
-2	-3022	.1011	.0173	.0304	.0068		-2	-2731	.1092	-.0027	.0278	.0079
0	-2056	.0968	.0139	.0183	.0064		0	-1735	.1042	.0042	.0167	.0079
2	-1216	.0936	.0112	.0092	.0065		2	-0837	.0963	-.0020	.0065	.0073
4	-0376	.0905	.0099	-.0008	.0065		4	-0040	.0993	-.0054	-.0038	.0075
6	.0639	.0949	.0071	-.0123	.0069		6	.0857	.1042	-.0052	-.0142	.0082
8	.1793	.1117	.0095	-.0242	.0092		8	.1954	.1191	-.0138	-.0266	.0103
10	.2733	.1311	.0050	-.0327	.0125		10	.3050	.1340	-.0191	-.0376	.0136
12	.3674	.1573	.0126	-.0403	.0159		12	.4047	.1598	-.0153	-.0461	.0169
16	.4802	.2091	.0481	-.0462	.0213		16	.5343	.2104	.0156	-.0538	.0226
20	.5868	.2747	.0679	-.0526	.0278		20	.6540	.2829	.0081	-.0649	.0306
$M = 0.85$											$M = 1.05$	
-4	-4056	.1167	.0041	.0419	.0088		-4	-3770	.1239	.0059	.0393	.0090
-2	-2931	.1021	.0170	.0288	.0069		-2	-2813	.1143	.0014	.0279	.0081
0	-1958	.0963	.0128	.0175	.0065		0	-1761	.1048	.0010	.0164	.0077
2	-1172	.0934	.0118	.0083	.0067		2	-0957	.1000	-.0069	.0066	.0073
4	-0258	.0916	.0077	-.0018	.0067		4	-0038	.0991	-.0084	-.0041	.0073
6	.0739	.0963	.0065	-.0130	.0073		6	.0919	.1048	-.0126	-.0151	.0079
8	.1911	.1097	.0053	-.0250	.0095		8	.1971	.1162	-.0184	-.0274	.0099
10	.2849	.1302	.0058	-.0341	.0135		10	.3119	.1353	-.0325	-.0398	.0131
12	.3786	.1547	.0119	-.0407	.0166		12	.4172	.1620	-.0376	-.0500	.0171
16	.4959	.2054	.0453	-.0477	.0223		16	.5511	.2163	-.0211	-.0598	.0234
20	.5932	.2720	.0592	-.0536	.0277		20	.6947	.2954	-.0343	-.0721	.0323
$M = 0.90$											$M = 1.10$	
-4	-4015	.1197	.0039	.0417	.0093		-4	-3640	.1159	.0064	.0388	.0087
-2	-2912	.1038	.0172	.0283	.0071		-2	-2698	.1030	.0007	.0269	.0078
0	-1853	.0989	.0122	.0174	.0069		0	-1700	.0994	.0003	.0155	.0074
2	-1059	.0934	.0105	.0081	.0070		2	-0942	.0938	-.0063	.0063	.0071
4	-0154	.0934	.0104	-.0021	.0070		4	-0074	.0938	-.0087	-.0038	.0072
6	.0838	.0950	.0077	-.0140	.0074		6	.0887	.1012	-.0113	-.0150	.0075
8	.1941	.1109	.0058	-.0255	.0101		8	.2088	.1122	-.0166	-.0280	.0096
10	.2934	.1263	.0062	-.0348	.0135		10	.3012	.1362	-.0313	-.0394	.0125
12	.3817	.1538	.0118	-.0406	.0164		12	.4028	.1647	-.0374	-.0489	.0164
16	.5074	.2060	.0410	-.0489	.0225		16	.5414	.2162	-.0273	-.0596	.0226
20	.6023	.2741	.0507	-.0557	.0293		20	.6892	.2944	-.0387	-.0728	.0319

TABLE VIII. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 1

## (a) Plain wing

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$											
-4	-0.2276	0.0199	0.0205	0.0270	0.0012	-4	-0.2378	0.0216	-0.0197	0.0287	0.0011
-2	-0.1402	0.0154	0.0150	0.0164	0.0017	-2	-0.1344	0.0129	-0.0157	0.0158	0.0009
0	-0.0273	0.0127	0.0072	0.0031	0.0012	0	-0.0248	0.0098	-0.0109	0.0027	0.0008
2	0.0637	0.0172	0.0068	-0.0084	0.0012	2	0.0682	0.0103	-0.0026	-0.0083	0.0010
4	0.1511	0.0227	0.0027	-0.0195	0.0017	4	0.1654	0.0139	0.0076	-0.0202	0.0021
6	0.2640	0.0363	0.0193	-0.0320	0.0027	6	0.2750	0.0206	0.0160	-0.0333	0.0034
8	0.3823	0.0580	0.0177	-0.0468	0.0067	8	0.3928	0.0355	0.0182	-0.0469	0.0060
10	0.4916	0.0888	0.0214	-0.0571	0.0111	10	0.4859	0.0576	0.0116	-0.0577	0.0098
12	0.5972	0.1260	0.0463	-0.0647	0.0160	12	0.5789	0.0896	0.0118	-0.0655	0.0158
16	0.7246	0.1985	0.0906	-0.0722	0.0241	16	0.7030	0.1565	0.0440	-0.0735	0.0241
20	0.7829	0.2756	0.1112	-0.0747	0.0313	20	0.7960	0.2362	0.0598	-0.0800	0.0326
$M = 0.80$											
-4	-0.2473	0.0191	0.0321	0.0281	0.0012	-4	-0.2460	0.0240	-0.0132	0.0293	0.0012
-2	-0.1360	0.0135	0.0169	0.0159	0.0012	-2	-0.1279	0.0142	-0.0065	0.0160	0.0009
0	-0.0247	0.0111	0.0071	0.0026	0.0012	0	-0.0197	0.0108	0.0042	0.0025	0.0006
2	0.0594	0.0117	0.0037	-0.0079	0.0011	2	0.0689	0.0108	-0.0047	-0.0084	0.0011
4	0.1608	0.0179	0.0079	-0.0200	0.0019	4	0.1575	0.0142	-0.0088	-0.0209	0.0022
6	0.2634	0.0271	0.0193	-0.0322	0.0031	6	0.2756	0.0216	0.0032	-0.0342	0.0035
8	0.3895	0.0474	0.0252	-0.0463	0.0071	8	0.3799	0.0363	-0.0098	-0.0480	0.0063
10	0.5008	0.0763	0.0278	-0.0565	0.0113	10	0.4783	0.0559	-0.0093	-0.0597	0.0094
12	0.5936	0.1090	0.0525	-0.0642	0.0158	12	0.5669	0.0828	-0.0187	-0.0696	0.0142
16	0.6999	0.1736	0.0687	-0.0718	0.0233	16	0.6987	0.1514	0.0261	-0.0767	0.0241
20	0.7346	0.2426	0.0950	-0.0709	0.0295	20	0.7972	0.2274	0.0337	-0.0826	0.0328
$M = 0.85$											
-4	-0.2423	0.0195	0.0309	0.0283	0.0011	-4	-0.2370	0.0255	-0.0053	0.0292	0.0018
-2	-0.1385	0.0126	0.0199	0.0164	0.0012	-2	-0.1327	0.0179	-0.0009	0.0162	0.0013
0	-0.0300	0.0092	0.0101	0.0032	0.0011	0	-0.0190	0.0151	-0.0027	0.0024	0.0010
2	0.0646	0.0109	0.0038	-0.0083	0.0011	2	0.0664	0.0151	-0.0044	-0.0083	0.0013
4	0.1569	0.0167	0.0047	-0.0198	0.0020	4	0.1517	0.0160	-0.0119	-0.0198	0.0026
6	0.2700	0.0259	0.0210	-0.0324	0.0032	6	0.2559	0.0255	-0.0103	-0.0325	0.0039
8	0.3808	0.0425	0.0158	-0.0459	0.0066	8	0.3697	0.0373	-0.0108	-0.0463	0.0061
10	0.4847	0.0684	0.0178	-0.0563	0.0111	10	0.4739	0.0585	-0.0196	-0.0592	0.0098
12	0.5770	0.1000	0.0328	-0.0634	0.0157	12	0.5498	0.0798	-0.0310	-0.0685	0.0139
16	0.7039	0.1660	0.0725	-0.0715	0.0232	16	0.6919	0.1411	-0.0206	-0.0795	0.0238
20	0.7386	0.2350	0.0838	-0.0721	0.0299	20	0.8152	0.2213	-0.0154	-0.0893	0.0342
$M = 0.90$											
-4	-0.2437	0.0211	0.0306	0.0283	0.0011	-4	-0.2284	0.0268	-0.0006	0.0282	0.0021
-2	-0.1458	0.0146	0.0226	0.0166	0.0012	-2	-0.1224	0.0177	0.0031	0.0155	0.0017
0	-0.0326	0.0103	0.0124	0.0028	0.0009	0	-0.0274	0.0155	-0.0046	0.0025	0.0013
2	0.0609	0.0103	0.0043	-0.0078	0.0012	2	0.0548	0.0155	-0.0095	-0.0078	0.0016
4	0.1523	0.0152	0.0034	-0.0194	0.0023	4	0.1462	0.0173	-0.0146	-0.0192	0.0027
6	0.2720	0.0238	0.0183	-0.0328	0.0033	6	0.2558	0.0246	-0.0073	-0.0319	0.0039
8	0.3873	0.0401	0.0197	-0.0464	0.0063	8	0.3472	0.0368	-0.0122	-0.0449	0.0063
10	0.5004	0.0661	0.0221	-0.0564	0.0111	10	0.4477	0.0541	-0.0242	-0.0565	0.0089
12	0.5874	0.0969	0.0331	-0.0637	0.0159	12	0.5299	0.0760	-0.0365	-0.0668	0.0134
16	0.7071	0.1619	0.0574	-0.0717	0.0234	16	0.6760	0.1360	-0.0180	-0.0779	0.0225
20	0.7615	0.2323	0.0750	-0.0753	0.0308	20	0.8039	0.2156	-0.0268	-0.0886	0.0338
$M = 1.00$											
-4	-0.2460	0.0240	-0.0132	0.0293	0.0012	-4	-0.2460	0.0240	-0.0132	0.0293	0.0012
-2	-0.1279	0.0142	-0.0065	0.0160	0.0009	-2	-0.1279	0.0142	-0.0065	0.0160	0.0009
0	-0.0197	0.0108	0.0042	0.0025	0.0006	0	-0.0197	0.0108	0.0042	0.0025	0.0006
2	0.0689	0.0108	-0.0047	-0.0084	0.0011	2	0.0689	0.0108	-0.0047	-0.0084	0.0011
4	0.1575	0.0142	-0.0088	-0.0209	0.0022	4	0.1575	0.0142	-0.0088	-0.0209	0.0022
6	0.2756	0.0216	0.0032	-0.0342	0.0035	6	0.2756	0.0216	0.0032	-0.0342	0.0035
8	0.3799	0.0363	-0.0098	-0.0480	0.0063	8	0.3799	0.0363	-0.0098	-0.0480	0.0063
10	0.4783	0.0559	-0.0093	-0.0597	0.0094	10	0.4783	0.0559	-0.0093	-0.0597	0.0094
12	0.5669	0.0828	-0.0187	-0.0696	0.0142	12	0.5669	0.0828	-0.0187	-0.0696	0.0142
16	0.6987	0.1514	0.0261	-0.0767	0.0241	16	0.6987	0.1514	0.0261	-0.0767	0.0241
20	0.7972	0.2274	0.0337	-0.0826	0.0328	20	0.7972	0.2274	0.0337	-0.0826	0.0328
$M = 1.05$											
-4	-0.2370	0.0255	-0.0053	0.0292	0.0018	-4	-0.2370	0.0255	-0.0053	0.0292	0.0018
-2	-0.1327	0.0179	-0.0009	0.0162	0.0013	-2	-0.1327	0.0179	-0.0009	0.0162	0.0013
0	-0.0190	0.0151	-0.0027	0.0024	0.0010	0	-0.0190	0.0151	-0.0027	0.0024	0.0010
2	0.0664	0.0151	-0.0044	-0.0083	0.0013	2	0.0664	0.0151	-0.0044	-0.0083	0.0013
4	0.1517	0.0160	-0.0119	-0.0198	0.0026	4	0.1517	0.0160	-0.0119	-0.0198	0.0026
6	0.2559	0.0255	-0.0103	-0.0325	0.0039	6	0.2559	0.0255	-0.0103	-0.0325	0.0039
8	0.3697	0.0373	-0.0108	-0.0463	0.0061	8	0.3697	0.0373	-0.0108	-0.0463	0.0061
10	0.4739	0.0585	-0.0196	-0.0592	0.0098	10	0.4739	0.0585	-0.0196	-0.0592	0.0098
12	0.5498	0.0798	-0.0310	-0.0685	0.0139	12	0.5498	0.0798	-0.0310	-0.0685	0.0139
16	0.6919	0.1411	-0.0206	-0.0795	0.0238	16	0.6919	0.1411	-0.0206	-0.0795	0.0238
20	0.8152	0.2213	-0.0154	-0.0893	0.0342	20	0.8152	0.2213	-0.0154	-0.0893	0.0342
$M = 1.10$											
-4	-0.2284	0.0268	-0.0006	0.0282	0.0021	-4	-0.2284	0.0268	-0.0006	0.0282	0.0021
-2	-0.1224	0.0177	0.0031	0.0155	0.0017	-2	-0.1224	0.0177	0.0031	0.0155	0.0017
0	-0.0274	0.0155	-0.0046	0.0025	0.0013	0	-0.0274	0.0155	-0.0046	0.0025	0.0013
2	0.0548	0.0155	-0.0095	-0.0078	0.0016	2	0.0548	0.0155	-0.0095	-0.0078	0.0016
4	0.1462	0.0173	-0.0146	-0.0192	0.0027	4	0.1462	0.0173	-0.0146	-0.0192	0.0027
6	0.2558	0.0246	-0.0073	-0.0319	0.0039	6	0.2558	0.0246	-0.0073	-0.0319	0.0039
8	0.3472	0.0368	-0.0122	-0.0449	0.0063	8	0.3472	0.0368	-0.0122	-0.0449	0.0063
10	0.4477	0.0541	-0.0242	-0.0565	0.0089	10	0.4477	0.0541	-0.0242	-0.0565	0.0089
12	0.5299	0.0760	-0.0365	-0.0668	0.0134	12	0.5299	0.0760	-0.0365	-0.0668	0.0134
16	0.6760	0.1360	-0.0180	-0.0779	0.0225	16	0.6760	0.1360	-0.0180	-0.0779	0.0225
20	0.8039	0.2156	-0.0268	-0.0886	0.0338	20	0.8039	0.2156	-0.0268	-0.0886	0.0338

TABLE VIII.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 1 - Continued

(b) Full-span spoiler slot deflector;  $\delta_S = -0.075$ ;  $\delta_d/\delta_S = 0.50$

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
<b>M = 0.60</b>										<b>M = 0.95</b>	
-4	-0.4833	.0817	.0285	.0532	.0343	-4	-0.4106	.1007	.0444	.0471	.0222
-2	-0.4267	.0844	.0329	.0468	.0348	-2	-0.3297	.0955	.0529	.0387	.0229
0	-0.3410	.0872	.0543	.0403	.0348	0	-0.2509	.0888	.0694	.0311	.0226
2	-0.2662	.0881	.0542	.0311	.0352	2	-0.1680	.0826	.0790	.0226	.0213
4	-0.1568	.0899	.0846	.0214	.0337	4	-0.0830	.0774	.0828	.0131	.0192
6	-0.0529	.0908	.0696	.0086	.0313	6	.0249	.0811	.0812	.0011	.0183
8	.0930	.1035	.0728	-.0069	.0312	8	.1431	.0862	.0717	-.0110	.0178
10	.2371	.1198	.0601	-.0231	.0315	10	.2468	.0981	.0634	-.0213	.0182
12	.3556	.1471	.0680	-.0336	.0340	12	.3505	.1172	.0687	-.0298	.0205
16	.4942	.1970	.0855	-.0451	.0398	16	.4936	.1600	.0844	-.0405	.0253
20	.6219	.2633	.1066	-.0545	.0475	20	.6076	.2215	.0796	-.0499	.0323
<b>M = 0.80</b>										<b>M = 1.00</b>	
-4	-0.4611	.0957	.0465	.0512	.0334	-4	-0.3869	.1042	.0425	.0451	.0232
-2	-0.3867	.0907	.0487	.0430	.0339	-2	-0.3001	.0973	.0543	.0367	.0233
0	-0.2975	.0876	.0744	.0352	.0341	0	-0.2251	.0909	.0680	.0289	.0229
2	-0.2070	.0833	.0867	.0267	.0332	2	-0.1500	.0860	.0732	.0208	.0220
4	-0.1202	.0771	.0853	.0172	.0313	4	-0.0592	.0796	.0797	.0112	.0198
6	-0.0087	.0802	.0857	.0052	.0299	6	.0474	.0845	.0746	.0005	.0188
8	.1215	.0876	.0796	-.0088	.0292	8	.1520	.0894	.0610	-.0105	.0186
10	.2454	.1000	.0658	-.0223	.0299	10	.2586	.0988	.0535	-.0206	.0188
12	.3508	.1210	.0735	-.0313	.0319	12	.3593	.1184	.0511	-.0240	.0211
16	.4958	.1679	.0994	-.0425	.0371	16	.4955	.1622	.0644	-.0308	.0266
20	.6148	.2314	.1131	-.0517	.0441	20	.6120	.2192	.0648	-.0385	.0333
<b>M = 0.85</b>										<b>M = 1.05</b>	
-4	-0.4445	.0951	.0521	.0498	.0327	-4	-0.3765	.1160	.0452	.0466	.0255
-2	-0.3635	.0893	.0567	.0412	.0332	-2	-0.2966	.1037	.0579	.0404	.0255
0	-0.2894	.0864	.0704	.0339	.0335	0	-0.2111	.0970	.0717	.0331	.0251
2	-0.2084	.0824	.0801	.0260	.0329	2	-0.1369	.0914	.0752	.0244	.0236
4	-0.1065	.0755	.0860	.0157	.0305	4	-0.0418	.0871	.0807	.0130	.0216
6	.0093	.0790	.0957	.0038	.0295	6	.0608	.0895	.0764	.0029	.0208
8	.1250	.0859	.0795	-.0099	.0288	8	.1597	.0970	.0593	-.0081	.0208
10	.2408	.0980	.0659	-.0222	.0294	10	.2586	.1065	.0422	-.0182	.0212
12	.3542	.1181	.0781	-.0315	.0314	12	.3594	.1193	.0238	-.0239	.0225
16	.4931	.1642	.0942	-.0428	.0366	16	.5210	.1609	.0212	-.0303	.0280
20	.6088	.2288	.1126	-.0509	.0430	20	.6351	.2201	.0310	-.0370	.0345
<b>M = 0.90</b>										<b>M = 1.10</b>	
-4	-0.4408	.1005	.0417	.0490	.0219	-4	-0.3593	.0872	.0476	.0504	.0257
-2	-0.3470	.0951	.0565	.0402	.0223	-2	-0.2768	.1027	.0591	.0422	.0260
0	-0.2706	.0896	.0729	.0327	.0226	0	-0.2035	.0958	.0666	.0339	.0254
2	-0.1964	.0837	.0795	.0252	.0217	2	-0.1265	.0904	.0701	.0240	.0238
4	-0.0960	.0771	.0881	.0151	.0194	4	-0.0385	.0867	.0736	.0146	.0220
6	.0109	.0793	.0899	.0037	.0184	6	.0532	.0894	.0684	.0049	.0211
8	.1309	.0869	.0748	-.0097	.0177	8	.1448	.0958	.0509	-.0082	.0208
10	.2553	.0989	.0696	-.0224	.0184	10	.2548	.1050	.0383	-.0176	.0214
12	.3491	.1168	.0722	-.0306	.0203	12	.3373	.0922	.0148	-.0184	.0221
16	.4975	.1603	.0881	-.0420	.0253	16	.5023	.1552	.0047	-.0188	.0277
20	.6088	.2238	.0880	-.0514	.0326	20	.6398	.2140	-.0008	-.0284	.0352

TABLE VIII. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 1 - Continued

(c) Half-span spoiler slot deflector;  $\delta_s = -0.075$ ;  $\delta_d/\delta_s = 0.50$

$\alpha$ , deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$	$\alpha$ , deg	$c_L$	$c_D$	$c_m$	$c_l$	$c_n$	
$M = 0.60$											$M = 0.95$	
-4	-3908	.0676	.0421	.0452	.0069	-4	-3928	.0758	-.0391	.0424	.0059	
-2	-3184	.0540	.0437	.0344	.0058	-2	-3003	.0666	-.0299	.0319	.0057	
0	-2189	.0495	.0319	.0220	.0056	0	-2077	.0614	-.0135	.0213	.0057	
2	-1375	.0495	.0291	.0115	.0055	2	-1357	.0589	-.0102	.0122	.0059	
4	-0380	.0495	.0191	.0000	.0055	6	.0699	.0563	.0120	-.0113	.0051	
6	.0615	.0558	.0150	-.0124	.0048	8	.1727	.0666	.0167	-.0236	.0068	
8	.1610	.0721	.0090	-.0251	.0063	10	.2961	.0834	.0208	-.0368	.0098	
10	.2967	.0946	.0073	-.0400	.0098	12	.3990	.1075	.0190	-.0474	.0140	
12	.4179	.1234	.0104	-.0508	.0145	16	.5532	.1602	.0455	-.0597	.0209	
16	.5735	.1846	.0554	-.0617	.0236	20	.6807	.2278	.0575	-.0703	.0289	
20	.6766	.2612	.0814	-.0688	.0294							
$M = 0.80$											$M = 1.00$	
-4	-4192	.0673	.0490	.0444	.0062	-4	-3779	.0804	-.0199	.0421	.0072	
-2	-3208	.0581	.0405	.0335	.0056	-2	-2917	.0707	-.0141	.0317	.0070	
0	-2286	.0551	.0286	.0223	.0057	0	-1977	.0634	.0011	.0211	.0065	
2	-1426	.0520	.0221	.0122	.0057	2	-1194	.0634	.0009	.0111	.0070	
4	-0504	.0520	.0146	.0013	.0055	4	-0215	.0560	.0087	-.0005	.0056	
6	.0504	.0551	.0071	-.0112	.0052	6	.0764	.0585	.0201	-.0116	.0056	
8	.1647	.0673	.0028	-.0240	.0065	8	.1938	.0707	.0239	-.0250	.0070	
10	.2938	.0857	.0049	-.0385	.0100	10	.2917	.0853	.0182	-.0367	.0095	
12	.3983	.1120	.0132	-.0482	.0140	12	.3994	.1072	.0106	-.0493	.0137	
16	.5519	.1683	.0513	-.0598	.0211	16	.5756	.1608	.0189	-.0652	.0217	
20	.6491	.2356	.0730	-.0657	.0279	20	.6833	.2291	.0420	-.0719	.0293	
$M = 0.85$											$M = 1.05$	
-4	-4157	.0715	.0458	.0452	.0060	-4	-3600	.0788	-.0119	.0405	.0078	
-2	-3238	.0629	.0414	.0334	.0056	-2	-2696	.0704	-.0046	.0300	.0078	
0	-2205	.0572	.0217	.0218	.0056	0	-1810	.0634	.0004	.0187	.0076	
2	-1401	.0532	.0158	.0120	.0056	2	-0999	.0610	.0050	.0092	.0068	
4	-0482	.0515	.0100	.0012	.0055	4	-0057	.0587	.0026	-.0015	.0065	
6	.0482	.0560	.0018	-.0106	.0050	6	.0829	.0610	.0074	-.0132	.0065	
8	.1585	.0669	.0052	-.0234	.0063	8	.1866	.0718	.0098	-.0255	.0077	
10	.2963	.0858	.0098	-.0381	.0101	10	.2903	.0868	.0023	-.0384	.0100	
12	.3996	.1115	.0184	-.0482	.0140	12	.3940	.1070	-.0030	-.0494	.0136	
16	.6752	.1675	.1096	-.0608	.0211	16	.5636	.1586	-.3269	-.1353	.0226	
20	.6476	.2333	.0676	-.0661	.0280	20	.7050	.2252	-.0007	-.0788	.0313	
$M = 0.90$											$M = 1.10$	
-4	-4026	.0744	.0410	.0437	.0056	-4	-3380	.0737	-.0069	.0391	.0078	
-2	-3161	.0663	.0392	.0326	.0054	-2	-2563	.0679	-.0040	.0289	.0074	
0	-2186	.0593	.0219	.0215	.0056	0	-1745	.0611	.0004	.0181	.0080	
2	-1429	.0555	.0164	.0122	.0055	2	-0927	.0588	.0054	.0087	.0069	
4	-0455	.0539	.0053	.0011	.0053	4	-0018	.0579	.0089	-.0020	.0066	
6	.0628	.0566	.0056	-.0113	.0049	6	.0709	.0588	.0045	-.0123	.0065	
8	.1710	.0674	.0120	-.0235	.0067	8	.1799	.0692	.0095	-.0249	.0077	
10	.3009	.0862	.0165	-.0378	.0102	10	.2799	.0828	.0041	-.0364	.0096	
12	.3983	.1094	.0151	-.0480	.0140	12	.3889	.1041	.0029	-.0479	.0129	
16	.5499	.1617	.0452	-.0602	.0212	16	.5434	.1516	-.0199	-.0655	.0214	
20	.6689	.2306	.0676	-.0684	.0290	20	.6797	.2172	.1682	-.0394	.0307	

TABLE VIII. - AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH

SWEEP OF 45° AND TAPER RATIO OF 1 - Continued

(d) Half-span spoiler slot deflector;  $\delta_s = -0.075$ ;  $\delta_d/\delta_s = 0.75$ 

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
<b>M = 0.60</b>											
-4	-0.4187	.0852	.0511	.0441	.0080	-4	-0.3727	.0938	-0.0361	.0406	.0081
-2	-0.3186	.0761	.0520	.0320	.0073	-2	-0.2857	.0845	-0.0281	.0298	.0080
0	-0.2185	.0716	.0423	.0203	.0073	0	-0.1967	.0794	-0.0155	.0197	.0079
2	-0.1001	.0716	.0137	.0103	.0075	2	-0.1139	.0758	-0.0060	.0098	.0079
4	-0.0510	.0716	.0269	.0003	.0068	4	-0.0311	.0716	-0.0004	-0.0005	.0076
6	.0455	.0761	.0123	-0.0118	.0065	6	.0621	.0732	.0104	-0.0110	.0075
8	.1420	.0897	.0018	-0.0229	.0082	8	.1760	.0819	.0204	-0.0239	.0087
10	.2622	.1124	.0036	-0.0206	.0115	10	.2691	.0964	.0188	-0.0349	.0116
12	.3641	.1396	.0117	-0.0458	.0158	12	.3727	.1206	.0188	-0.0456	.0158
16	.4916	.1940	.0757	-0.0525	.0223	16	.4865	.1670	.0697	-0.0512	.0217
20	.6099	.2665	.0894	-0.0619	.0299	20	.6045	.2288	.0768	-0.0624	.0294
<b>M = 0.80</b>											
-4	-0.4082	.0887	.0467	.0435	.0080	-4	-0.3449	.1001	-0.0228	.0385	.0094
-2	-0.3031	.0764	.0458	.0305	.0071	-2	-0.2661	.0903	-0.0170	.0284	.0089
0	-0.2103	.0733	.0336	.0194	.0072	0	-0.1715	.0829	-0.0013	.0174	.0086
2	-0.1299	.0721	.0230	.0106	.0072	2	-0.1025	.0795	.0044	.0089	.0085
4	-0.0458	.0702	.0173	.0003	.0073	4	-0.0197	.0780	.0118	-0.0012	.0085
6	.0495	.0733	.0069	-0.0113	.0069	6	.0690	.0770	.0221	-0.0116	.0083
8	.1546	.0838	.0059	-0.0232	.0084	8	.1675	.0854	.0269	-0.0238	.0095
10	.2660	.0998	.0102	-0.0357	.0113	10	.2661	.0991	.0319	-0.0338	.0121
12	.3649	.1244	.0221	-0.0444	.0209	12	.3548	.1197	.0289	-0.0434	.0157
16	.4701	.1718	.0760	-0.0500	.0212	16	.4829	.1663	.0557	-0.0532	.0222
20	.5938	.2396	.0831	-0.0597	.0292	20	.6208	.2301	.0614	-0.0658	.0305
<b>M = 0.85</b>											
-4	-0.3985	.0886	.0450	.0429	.0078	-4	-0.3321	.0964	-0.0198	.0372	.0094
-2	-0.3003	.0799	.0442	.0307	.0073	-2	-0.2600	.0883	-0.0149	.0273	.0094
0	-0.2195	.0771	.0338	.0208	.0074	0	-0.1708	.0822	.0007	.0175	.0093
2	-0.1386	.0730	.0226	.0113	.0074	2	-0.0949	.0789	.0062	.0086	.0090
4	-0.0578	.0713	.0165	.0010	.0073	4	-0.0190	.0775	.0081	-0.0013	.0087
6	.0462	.0713	.0022	-0.0113	.0072	6	.0759	.0789	.0161	-0.0122	.0087
8	.1502	.0828	.0074	-0.0231	.0083	8	.1613	.0883	.0162	-0.0239	.0097
10	.2715	.1001	.0120	-0.0360	.0117	10	.2562	.1025	.0144	-0.0351	.0120
12	.3639	.0943	.0186	-0.0443	.0154	12	.3605	.1224	.0174	-0.0458	.0156
16	.4736	.1691	.0751	-0.0504	.0213	16	.4991	.1720	.0141	-0.0596	.0235
20	.5891	.2381	.0797	-0.0597	.0291	20	.6452	.2334	.0135	-0.0718	.0322
<b>M = 0.90</b>											
-4	-0.3879	.0917	.0433	.0418	.0077	-4	-0.3385	.0929	-0.0276	.0368	.0092
-2	-0.3029	.0835	.0383	.0312	.0076	-2	-0.2470	.0838	-0.0157	.0271	.0094
0	-0.2114	.0781	.0239	.0209	.0075	0	-0.1683	.0792	-0.0044	.0166	.0095
2	-0.1308	.0754	.0158	.0106	.0074	2	-0.0915	.0770	.0027	.0094	.0089
4	-0.0436	.0700	.0076	.0000	.0074	4	-0.0183	.0747	.0065	-0.0014	.0086
6	.0436	.0727	.0002	-0.0110	.0073	6	.0823	.0770	.0168	-0.0128	.0091
8	.1743	.0808	.0195	-0.0241	.0086	8	.1647	.0838	.0168	-0.0238	.0097
10	.2724	.0982	.0158	-0.0358	.0117	10	.2653	.0988	.0197	-0.0342	.0116
12	.3705	.1188	.0199	-0.0455	.0158	12	.3476	.1180	.0136	-0.0442	.0150
16	.4903	.1676	.0735	-0.0424	.0218	16	.4757	.1658	.0076	-0.0580	.0221
20	.5928	.2300	.0843	-0.0597	.0289	20	.6221	.2268	-0.0063	-0.0724	.0316
<b>M = 0.95</b>											
<b>M = 1.00</b>											
-4	-0.3449	.1001	-0.0228	.0385	.0094	-4	-0.3449	.1001	-0.0228	.0385	.0094
-2	-0.2661	.0903	-0.0170	.0284	.0089	-2	-0.2661	.0903	-0.0170	.0284	.0089
0	-0.1715	.0829	-0.0013	.0174	.0086	0	-0.1715	.0829	-0.0013	.0174	.0086
2	-0.1025	.0795	.0044	.0089	.0085	2	-0.1025	.0795	.0044	.0089	.0085
4	-0.0197	.0780	.0118	-0.0012	.0085	4	-0.0197	.0780	.0118	-0.0012	.0085
6	.0690	.0770	.0221	-0.0116	.0083	6	.0690	.0770	.0221	-0.0116	.0083
8	.1675	.0854	.0269	-0.0238	.0095	8	.1675	.0854	.0269	-0.0238	.0095
10	.2661	.0991	.0319	-0.0338	.0121	10	.2661	.0991	.0319	-0.0338	.0121
12	.3548	.1197	.0289	-0.0434	.0157	12	.3548	.1197	.0289	-0.0434	.0157
16	.4829	.1663	.0557	-0.0532	.0222	16	.4829	.1663	.0557	-0.0532	.0222
20	.6208	.2301	.0614	-0.0658	.0305	20	.6208	.2301	.0614	-0.0658	.0305
<b>M = 1.05</b>											
-4	-0.3321	.0964	-0.0198	.0372	.0094	-4	-0.3321	.0964	-0.0198	.0372	.0094
-2	-0.2600	.0883	-0.0149	.0273	.0094	-2	-0.2600	.0883	-0.0149	.0273	.0094
0	-0.1708	.0822	.0007	.0175	.0093	0	-0.1708	.0822	.0007	.0175	.0093
2	-0.0949	.0789	.0062	.0086	.0090	2	-0.0949	.0789	.0062	.0086	.0090
4	-0.0190	.0775	.0081	-0.0013	.0087	4	-0.0190	.0775	.0081	-0.0013	.0087
6	.0759	.0789	.0161	-0.0122	.0087	6	.0759	.0789	.0161	-0.0122	.0087
8	.1613	.0883	.0162	-0.0239	.0097	8	.1613	.0883	.0162	-0.0239	.0097
10	.2562	.1025	.0144	-0.0351	.0120	10	.2562	.1025	.0144	-0.0351	.0120
12	.3605	.1224	.0174	-0.0458	.0156	12	.3605	.1224	.0174	-0.0458	.0156
16	.4991	.1720	.0141	-0.0596	.0235	16	.4991	.1720	.0141	-0.0596	.0235
20	.6452	.2334	.0135	-0.0718	.0322	20	.6452	.2334	.0135	-0.0718	.0322
<b>M = 1.10</b>											
-4	-0.3385	.0929	-0.0276	.0368	.0092	-4	-0.3385	.0929	-0.0276	.0368	.0092
-2	-0.2470	.0838	-0.0157	.0271	.0094	-2	-0.2470	.0838	-0.0157	.0271	.0094
0	-0.1683	.0792	-0.0044	.0166	.0095	0	-0.1683	.0792	-0.0044	.0166	.0095
2	-0.0915	.0770	.0027	.0094	.0089	2	-0.0915	.0770	.0027	.0094	.0089
4	-0.0183	.0747	.0065	-0.0014	.0086	4	-0.0183	.0747	.0065	-0.0014	.0086
6	.0823	.0770	.0168	-0.0128	.0091	6	.0823	.0770	.0168	-0.0128	.0091
8	.1647	.0838	.0168	-0.0238	.0097	8	.1647	.0838	.0168	-0.0238	.0097
10	.2653	.0988	.0197	-0.0342	.0116	10	.2653	.0988	.0197	-0.0342	.0116
12	.3476	.1180	.0136	-0.0442	.0150	12	.3476	.1180	.0136	-0.0442	.0150
16	.4757	.1658	.0076	-0.0580	.0221	16	.4757	.1658	.0076	-0.0580	.0221
20	.6221	.2268	-0.0063	-0.0724	.0316	20	.6221	.2268	-0.0063	-0.0724	.0316

TABLE VIII.- AERODYNAMIC CHARACTERISTICS OF AN ASPECT-RATIO-4 WING WITH  
SWEEP OF 45° AND TAPER RATIO OF 1 - Concluded

(e) Half-span spoiler slot deflector;  $\delta_s = -0.075$ ;  $\delta_d/\delta_s = 1.00$

$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$	$\alpha$ , deg	$C_L$	$C_D$	$C_m$	$C_l$	$C_n$
$M = 0.60$										$M = 0.95$	
-4	-0.3725	0.0859	0.0531	0.0392	0.0078	-4	-0.3203	0.0952	-0.0531	0.0340	0.0082
-2	-0.2853	0.0796	0.0453	0.0288	0.0073	-2	-0.2417	0.0900	-0.0456	0.0244	0.0084
0	-0.1999	0.0769	0.0396	0.0180	0.0073	0	-0.1550	0.0849	-0.0339	0.0142	0.0085
2	-0.1272	0.0769	0.0336	0.0093	0.0075	2	-0.0868	0.0823	-0.0242	0.0057	0.0086
4	-0.0418	0.0769	0.0253	-0.0012	0.0075	4	-0.0103	0.0797	-0.0179	-0.0032	0.0086
6	0.0545	0.0796	0.0180	-0.0124	0.0071	6	0.0930	0.0823	-0.0018	-0.0149	0.0083
8	0.1544	0.0932	0.0085	-0.0241	0.0085	8	0.1756	0.0900	0.0039	-0.0248	0.0095
10	0.2725	0.1131	0.0125	-0.0383	0.0121	10	0.2851	0.1054	0.0012	-0.0368	0.0127
12	0.3816	0.1402	0.0007	-0.0475	0.0166	12	0.3884	0.1286	-0.0020	-0.0474	0.0172
16	0.4815	0.1945	0.0595	-0.0517	0.0224	16	0.4897	0.1764	0.0448	-0.0527	0.0230
20	0.5542	0.2533	0.0823	-0.0573	0.0291	20	0.5579	0.2315	0.0633	-0.0582	0.0299
$M = 0.80$										$M = 1.00$	
-4	-0.3459	0.0892	0.0503	0.0362	0.0077	-4	-0.3147	0.1028	-0.0362	0.0332	0.0096
-2	-0.2656	0.0830	0.0441	0.0267	0.0073	-2	-0.2360	0.0955	-0.0289	0.0236	0.0094
0	-0.1816	0.0800	0.0316	0.0167	0.0074	0	-0.1475	0.0906	-0.0162	0.0136	0.0094
2	-0.1112	0.0787	0.0259	0.0079	0.0078	2	-0.0787	0.0857	-0.0105	0.0054	0.0091
4	-0.0247	0.0757	0.0154	-0.0022	0.0077	4	0.0000	0.0832	-0.0048	-0.0039	0.0089
6	0.0741	0.0769	0.0024	-0.0133	0.0073	6	0.0787	0.0881	0.0009	-0.0141	0.0093
8	0.1791	0.0892	0.0017	-0.0256	0.0091	8	0.1869	0.0955	0.0106	-0.0254	0.0102
10	0.2965	0.1095	0.0017	-0.0387	0.0126	10	0.2655	0.1077	-0.0012	-0.0359	0.0128
12	0.3892	0.1322	0.0094	-0.0463	0.0169	12	0.3737	0.1273	-0.0015	-0.0468	0.0169
16	0.4756	0.1784	0.0629	-0.0506	0.0225	16	0.4917	0.1787	0.0319	-0.0551	0.0235
20	0.5436	0.2337	0.0738	-0.0559	0.0290	20	0.5704	0.2326	0.0576	-0.0603	0.0301
$M = 0.85$										$M = 1.05$	
-4	-0.3344	0.0890	0.0553	0.0352	0.0077	-4	-0.3125	0.1014	-0.0349	0.0332	0.0098
-2	-0.2595	0.0833	0.0454	0.0259	0.0075	-2	-0.2273	0.0943	-0.0280	0.0227	0.0096
0	-0.1730	0.0815	0.0337	0.0158	0.0076	0	-0.1420	0.0896	-0.0175	0.0131	0.0093
2	-0.1038	0.0792	0.0282	0.0071	0.0077	2	-0.0758	0.0872	-0.0141	0.0044	0.0093
4	-0.0196	0.0775	0.0178	-0.0028	0.0078	4	0.0000	0.0858	-0.0065	-0.0045	0.0093
6	0.0692	0.0792	0.0092	-0.0132	0.0075	6	0.0814	0.0872	-0.0029	-0.0143	0.0094
8	0.1730	0.0890	0.0037	-0.0253	0.0092	8	0.1799	0.0981	0.0005	-0.0263	0.0106
10	0.2998	0.1062	0.0023	-0.0385	0.0126	10	0.2746	0.1108	-0.0014	-0.0373	0.0127
12	0.3921	0.1309	0.0068	-0.0470	0.0168	12	0.3598	0.1296	-0.0109	-0.0470	0.0119
16	0.4844	0.1780	0.0588	-0.0514	0.0225	16	0.4829	0.1759	-0.0014	-0.0584	0.0241
20	0.5478	0.2325	0.0738	-0.0561	0.0292	20	0.5871	0.2338	0.0039	-0.0686	0.0319
$M = 0.90$										$M = 1.10$	
-4	-0.3261	0.0920	0.0540	0.0348	0.0077	-4	-0.2921	0.0955	-0.0290	0.0322	0.0096
-2	-0.2446	0.0866	0.0430	0.0251	0.0078	-2	-0.2191	0.0909	-0.0282	0.0222	0.0096
0	-0.1652	0.0823	0.0337	0.0149	0.0079	0	-0.1369	0.0864	-0.0170	0.0133	0.0096
2	-0.0870	0.0785	0.0273	0.0039	0.0080	2	-0.0730	0.0864	-0.0128	0.0044	0.0094
4	-0.0022	0.0758	0.0147	-0.0037	0.0079	4	0.0000	0.0818	-0.0075	-0.0047	0.0094
6	0.0815	0.0785	0.0097	-0.0145	0.0079	6	0.0913	0.0864	0.0036	-0.0145	0.0093
8	0.1794	0.0893	0.0005	-0.0257	0.0094	8	0.1826	0.0936	0.0049	-0.0260	0.0104
10	0.2989	0.1055	0.0052	-0.0385	0.0129	10	0.2648	0.1045	-0.0014	-0.0356	0.0125
12	0.4022	0.1299	0.0051	-0.0478	0.0172	12	0.3469	0.1273	-0.0115	-0.0458	0.0158
16	0.4946	0.1732	0.0511	-0.0521	0.0227	16	0.4656	0.1718	-0.0076	-0.0574	0.0229
20	0.5544	0.2300	0.0660	-0.0573	0.0295	20	0.5752	0.2318	-0.0072	-0.0679	0.0312

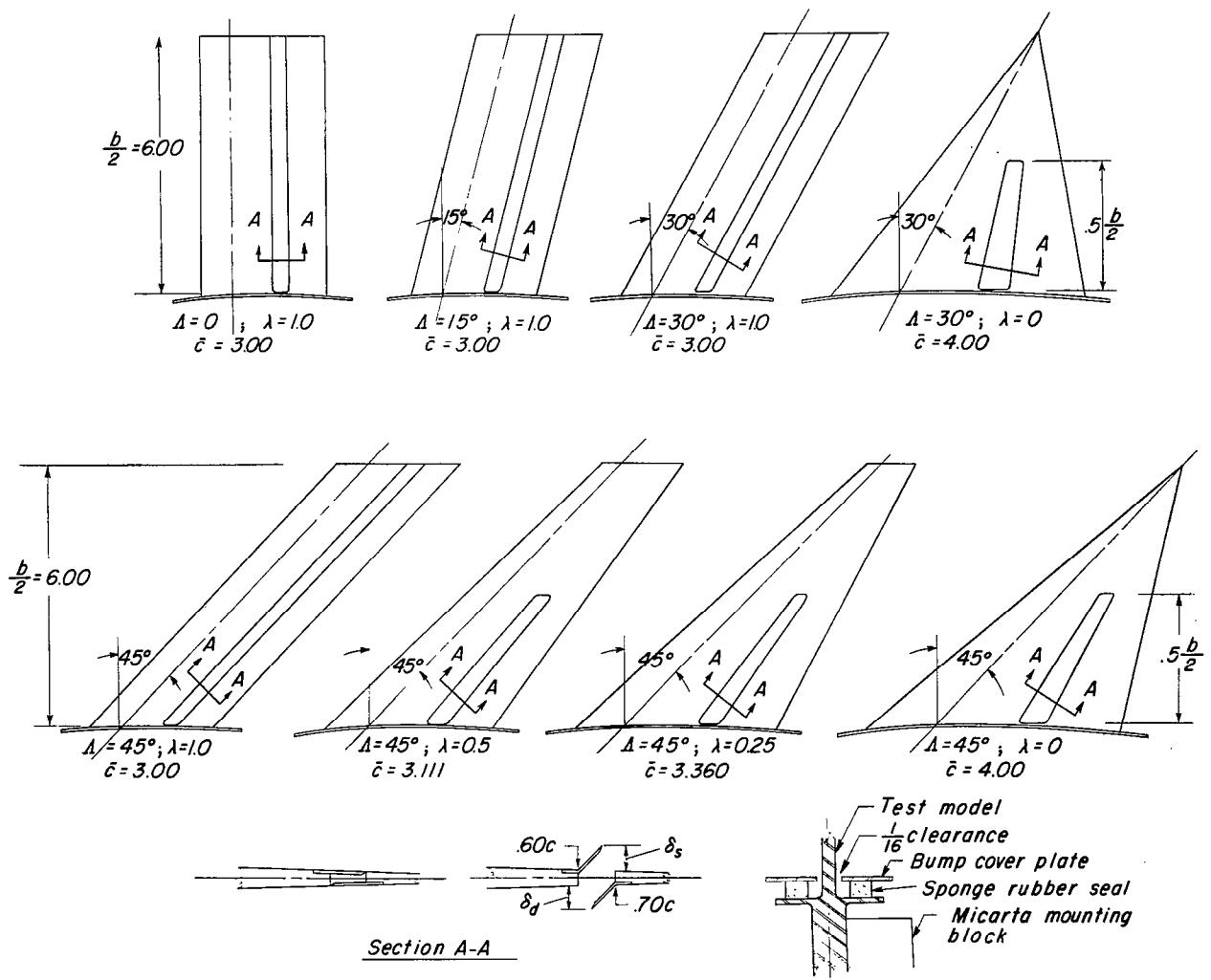


Figure 1.- Geometric characteristics of models used in investigation. All dimensions are in inches unless otherwise noted.

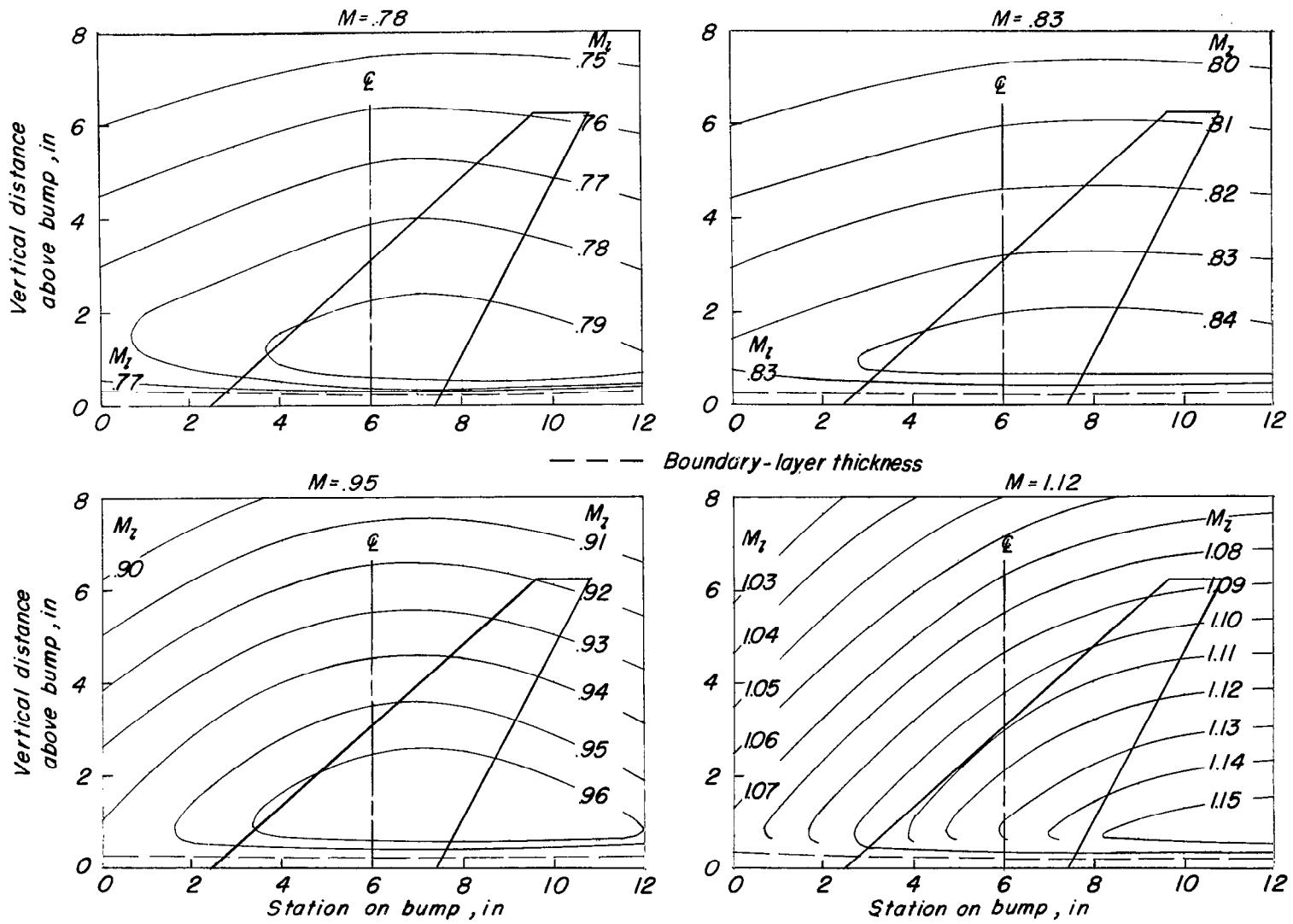


Figure 2.- Typical Mach number contours over transonic bump in region of model location.

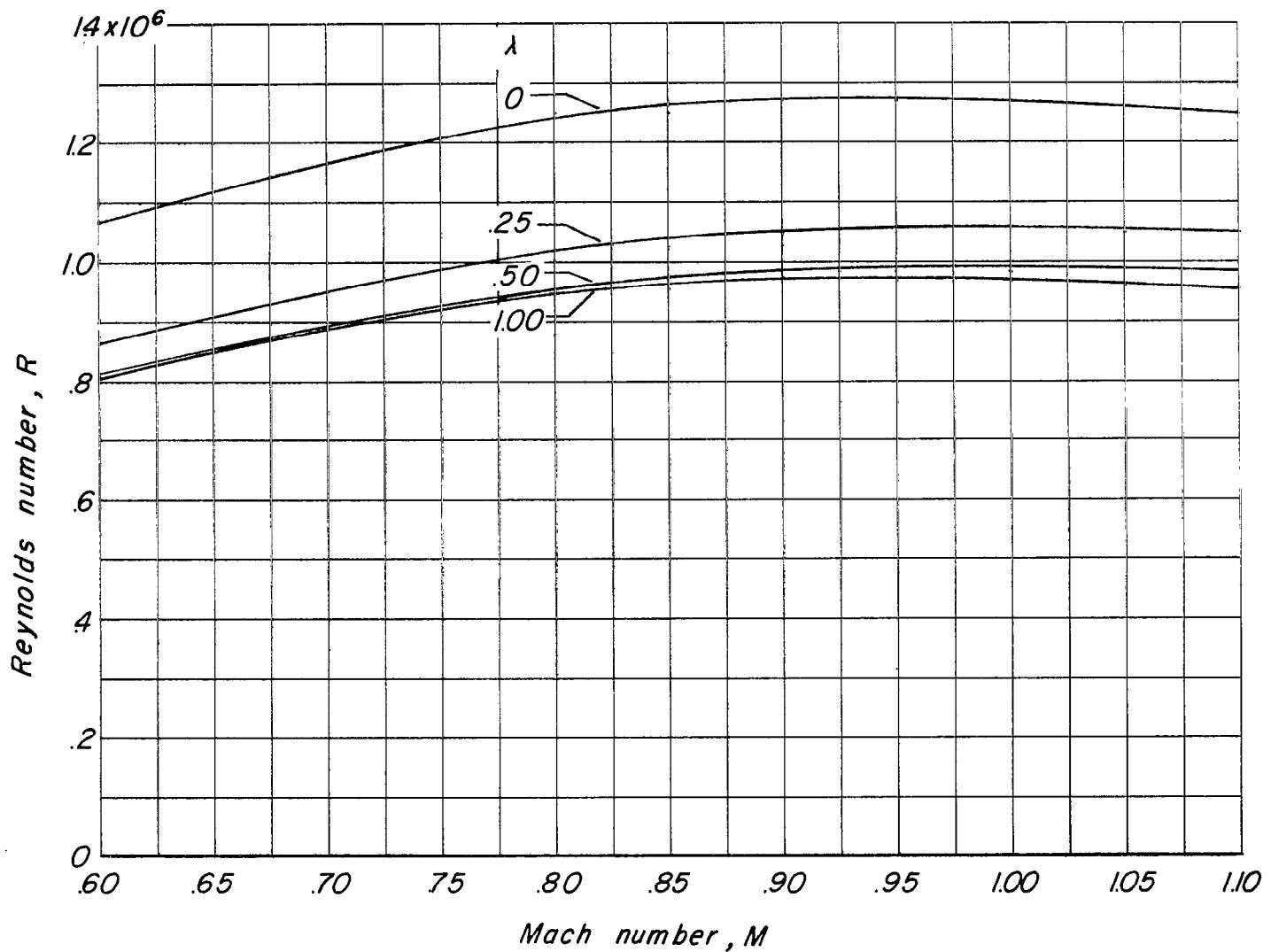
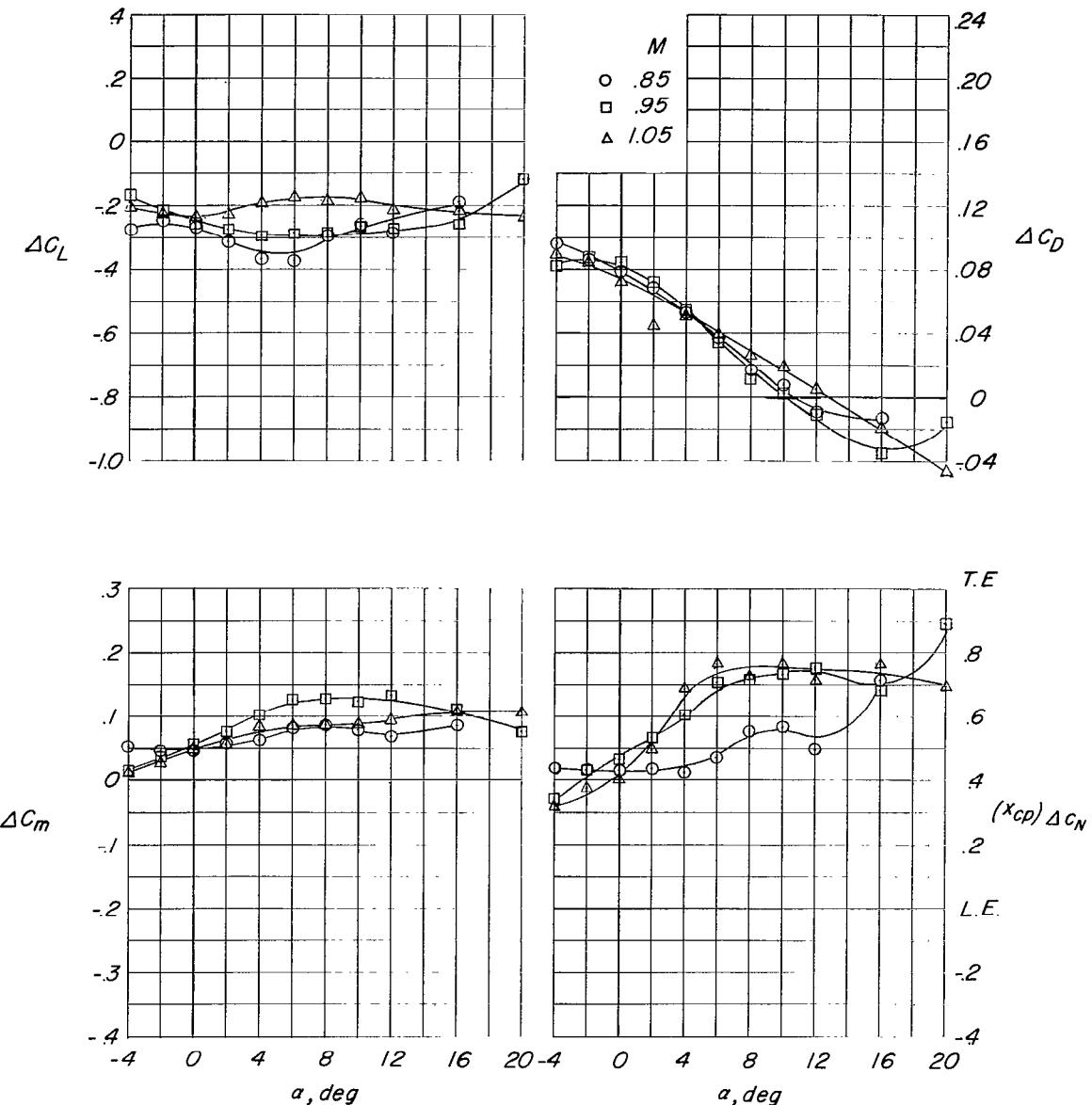
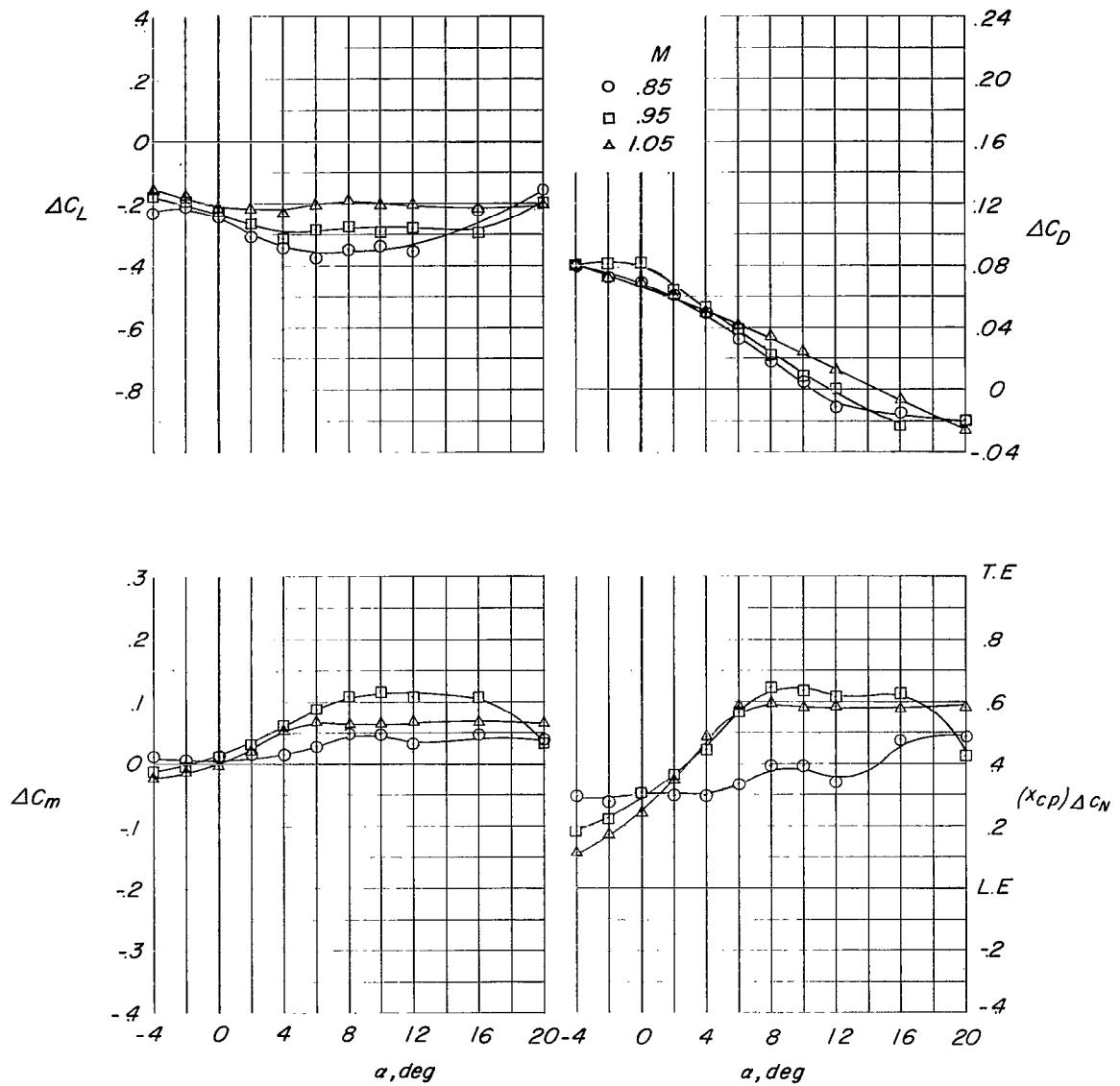


Figure 3.- Variation of test Reynolds number with Mach number, for various wing taper ratios.



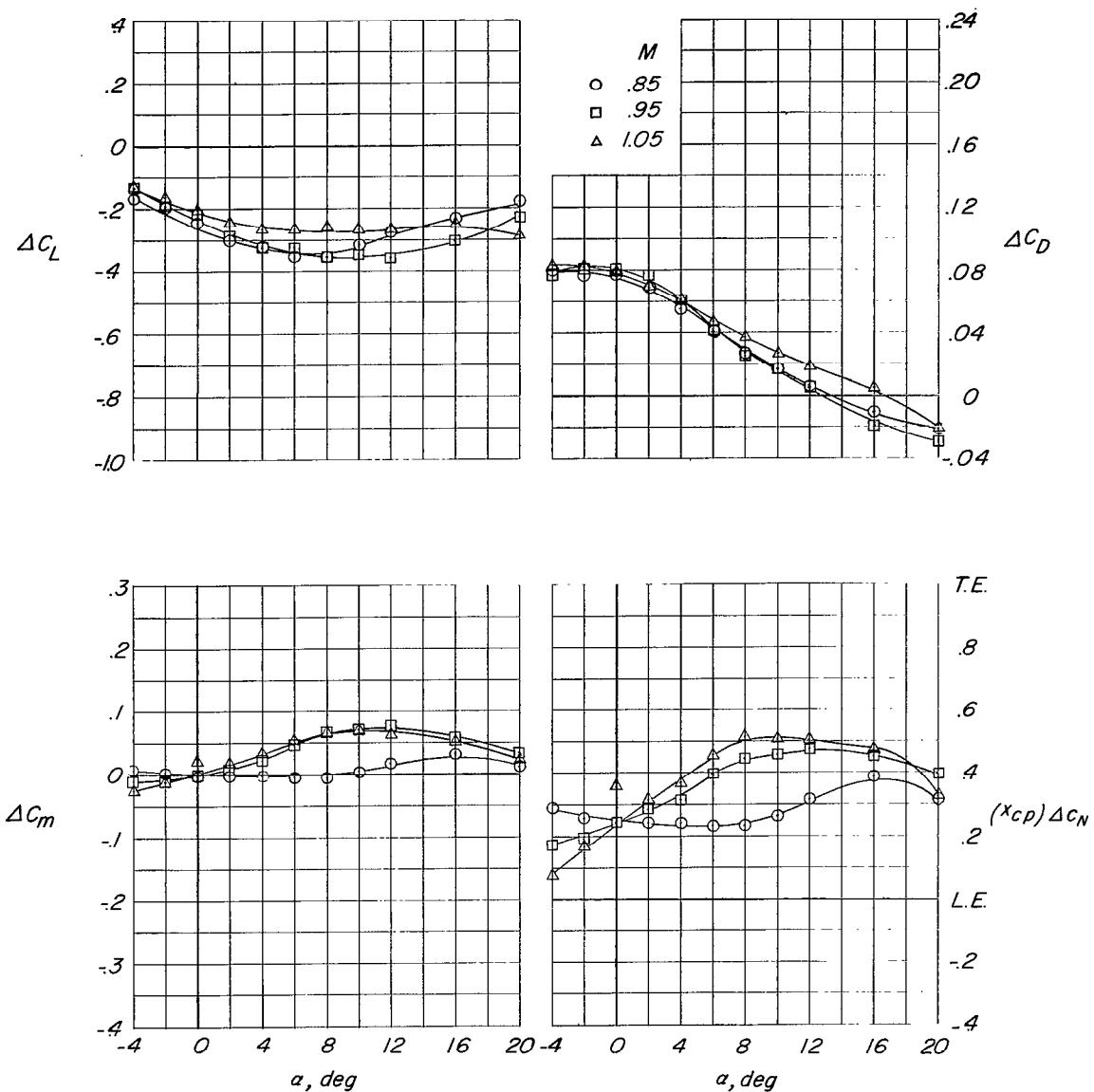
$$(a) \quad \Delta c/4 = 0^\circ; \lambda = 1.00; \delta_s = -0.075c; \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 4.- The effect of Mach number on the variation of the incremental lift, drag, and pitching-moment coefficients, and center of pressure with angle of attack for the spoiler-slot-deflector configuration on wings having sweeps of  $0^\circ$ ,  $15^\circ$ ,  $30^\circ$ , and  $45^\circ$ .



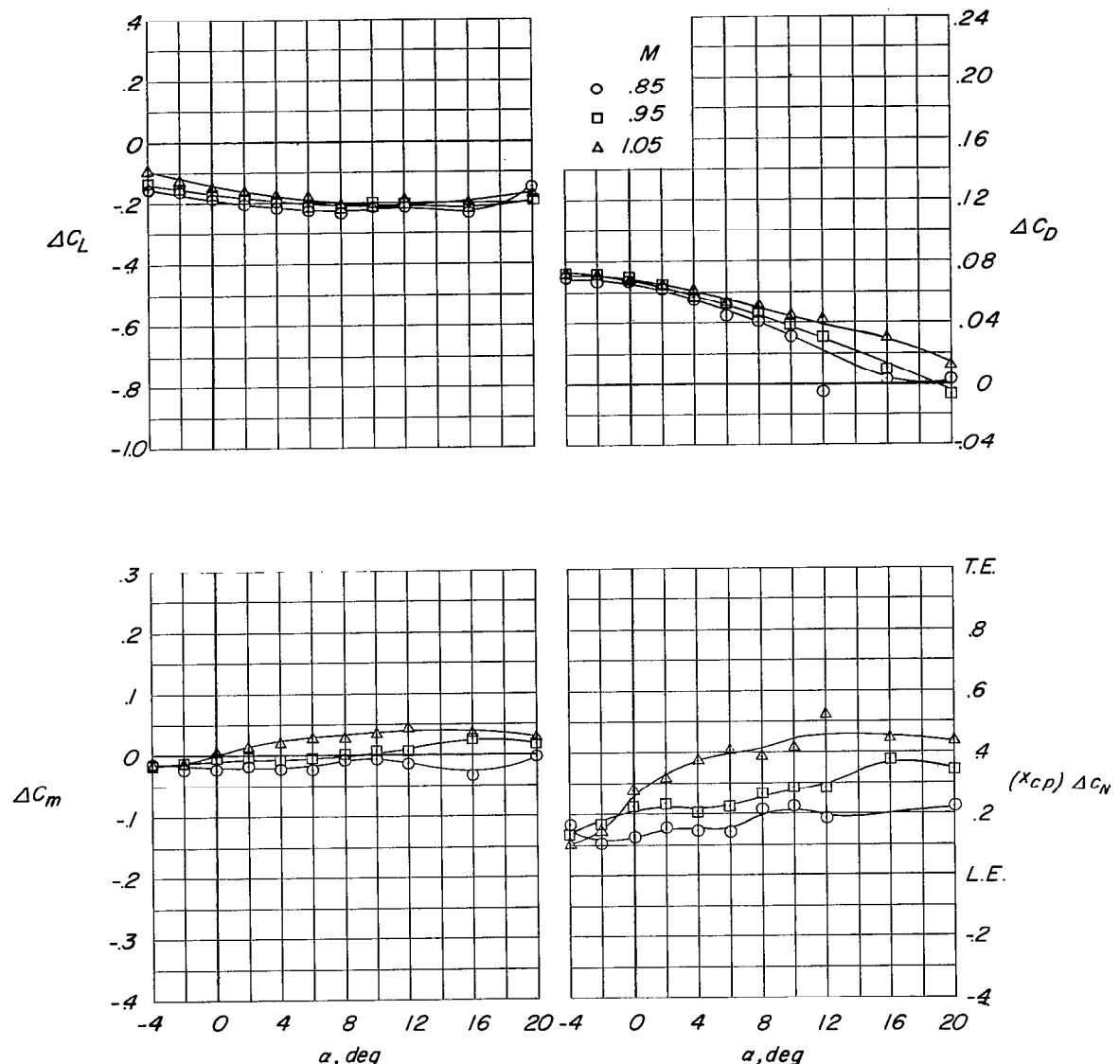
$$(b) \quad \Lambda_c/4 = 15^\circ; \lambda = 1.00; \delta_s = -0.075c; \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 4.- Continued.



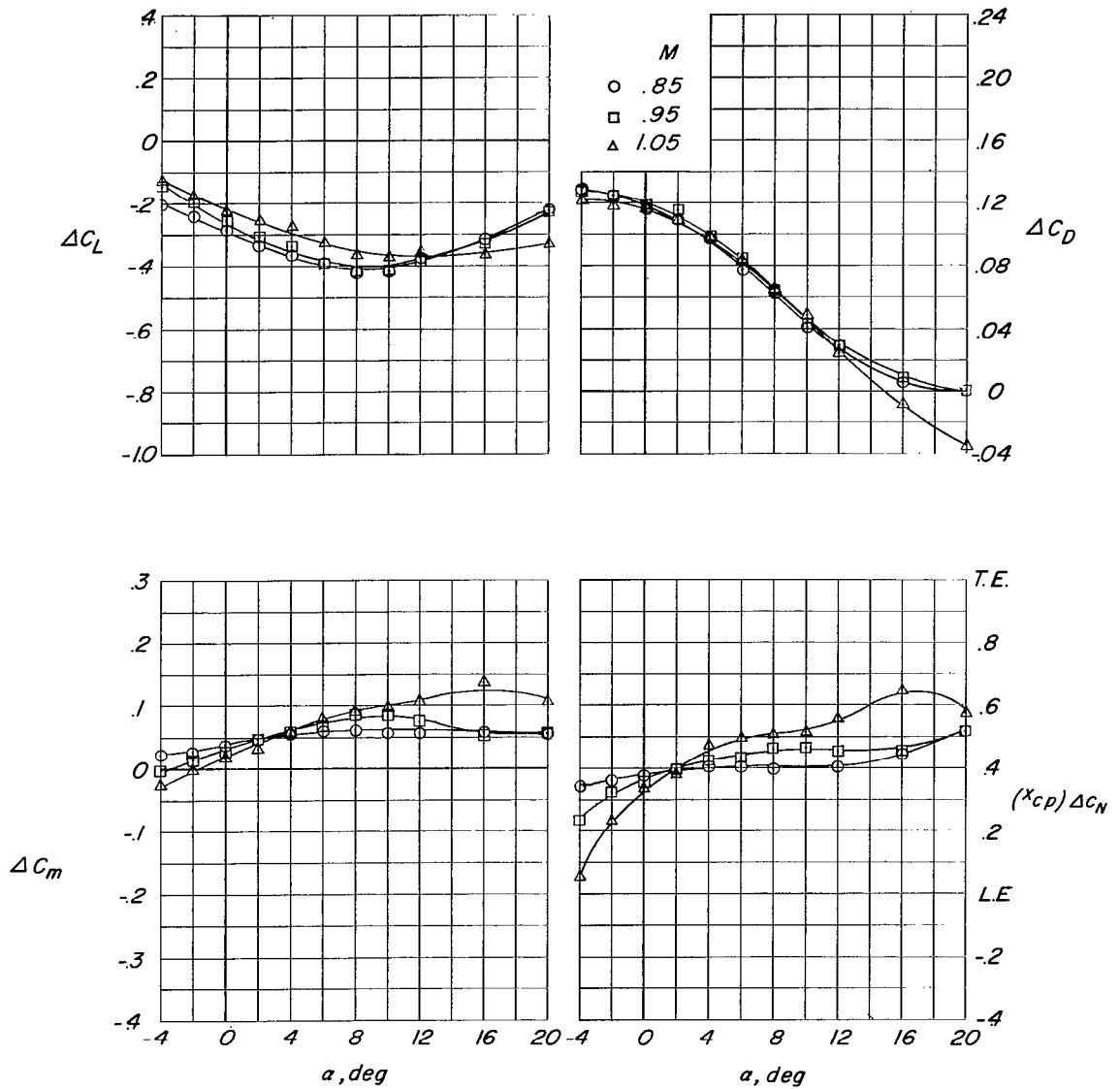
$$(c) \quad \Delta c_{l/4} = 30^\circ; \quad \lambda = 1.00; \quad \delta_s = -0.075c; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 4.- Continued.



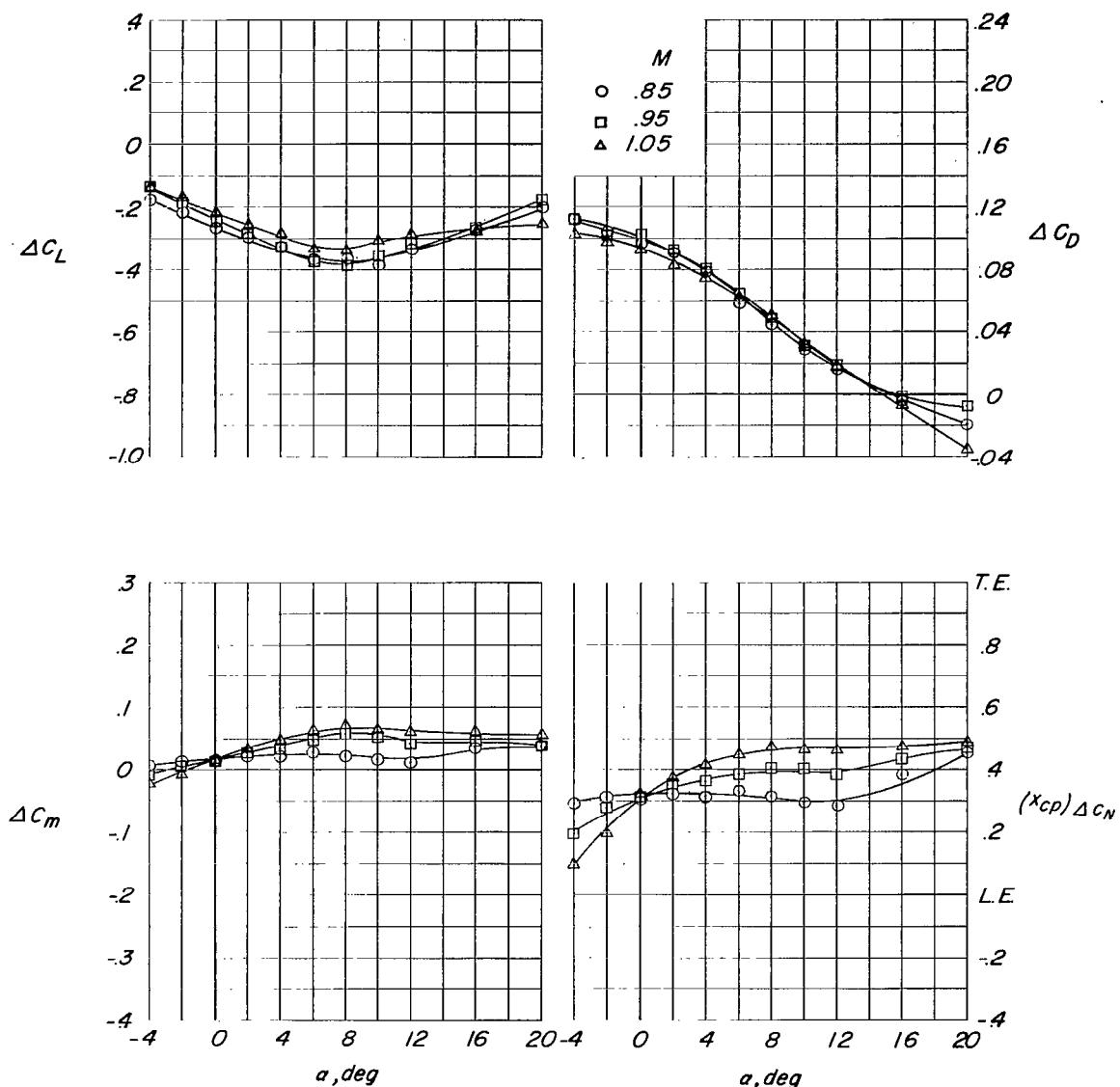
$$(d) \quad \Lambda_c/4 = 45^\circ; \quad \lambda = 1.00; \quad \delta_s = -0.075c; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 4.- Concluded.



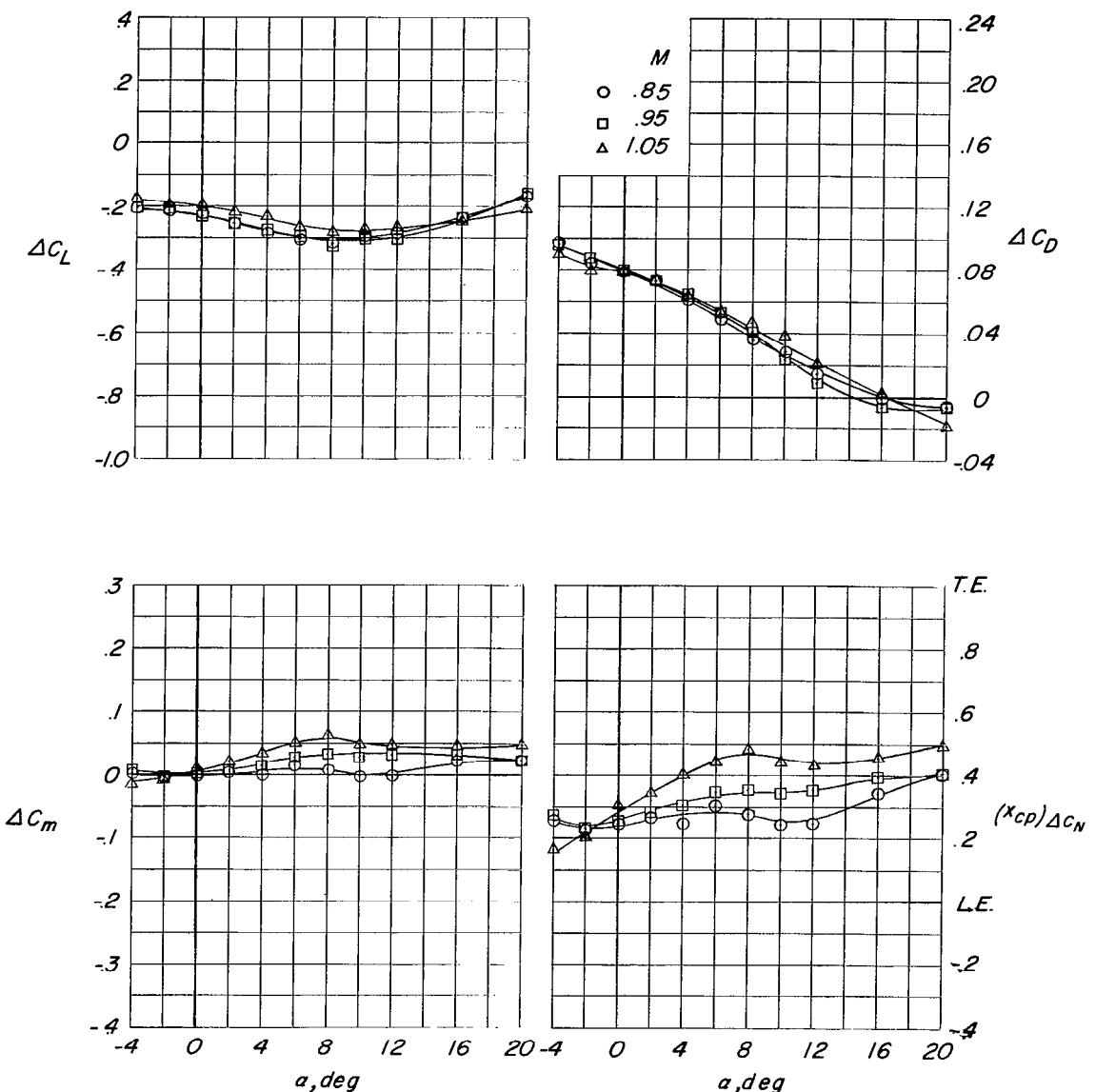
$$(a) \quad \lambda = 0; \quad \Lambda_c/4 = 45^\circ; \quad \delta_s = -0.075c; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 5.- The effect of Mach number on the variation of the incremental lift, drag, and pitching-moment coefficients, and center of pressure with angle of attack for the spoiler-slot-deflector configuration on the  $45^\circ$  swept wings having taper ratios of 0, 0.25, 0.50, and 1.00.



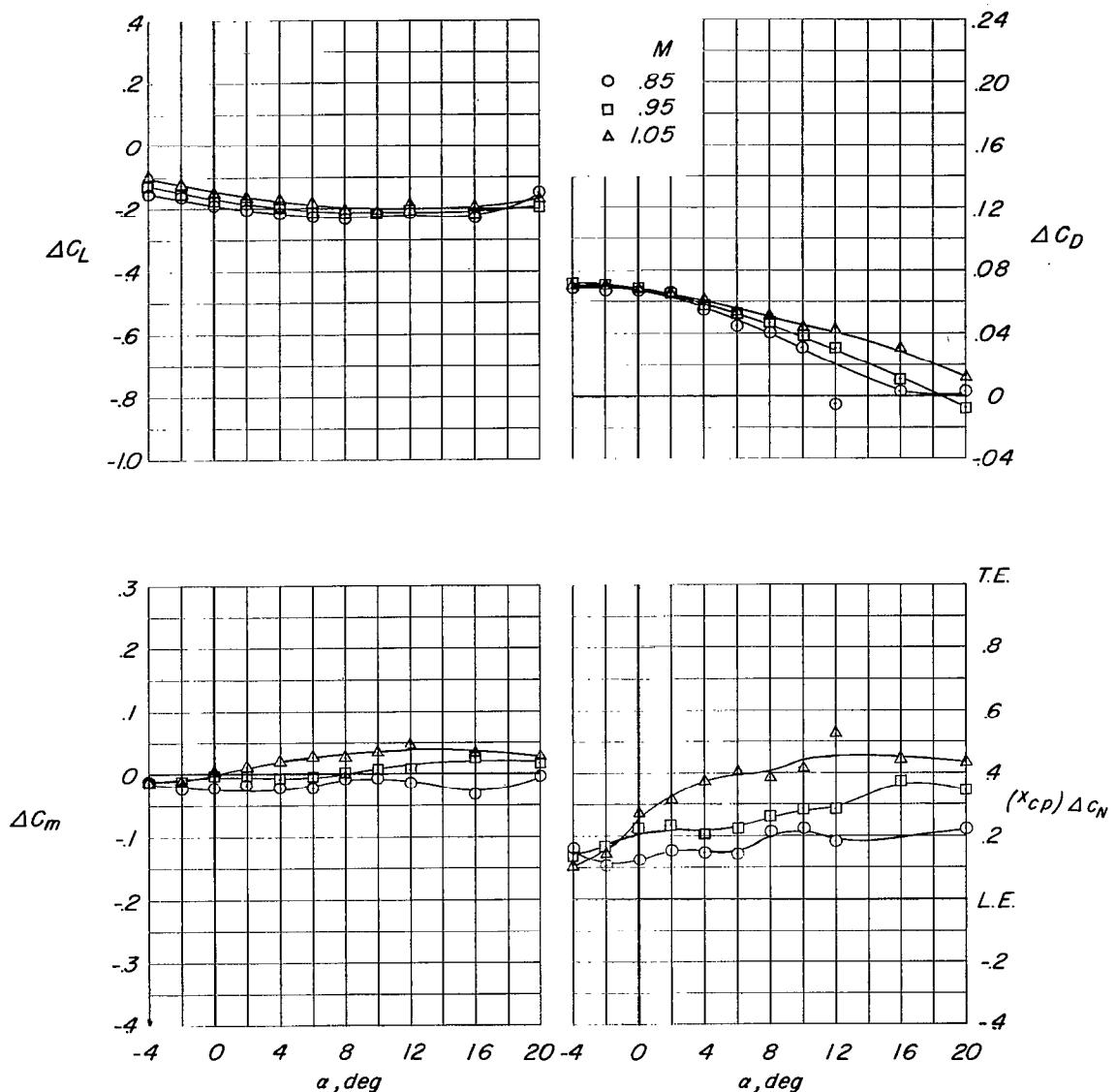
$$(b) \quad \lambda = 0.25; \quad \Delta c/4 = 45^\circ; \quad \delta_s = -0.075c; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 5.- Continued.



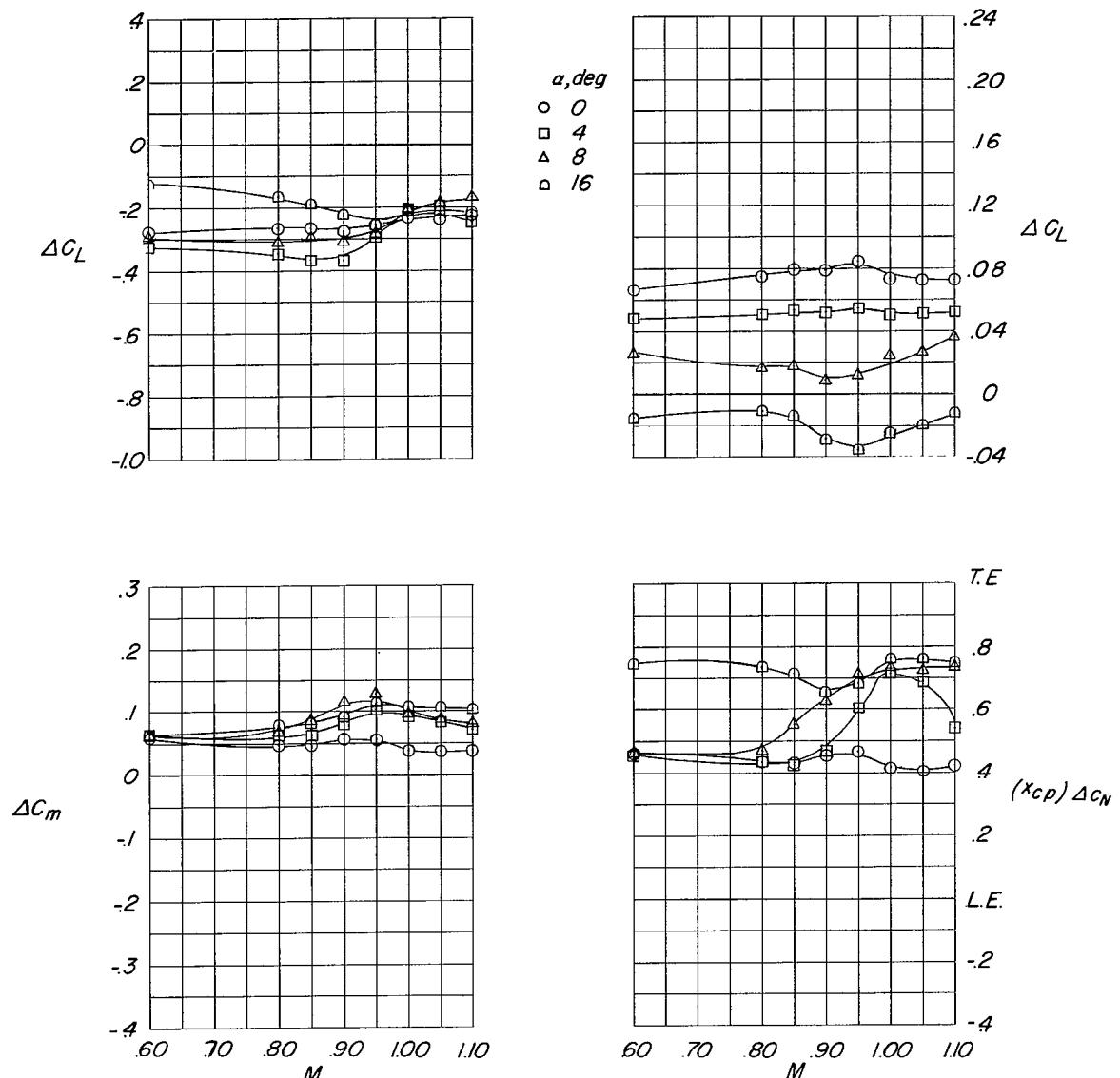
$$(c) \quad \lambda = 0.50; \quad \Lambda_C/4 = 45^\circ; \quad \delta_s = -0.075c; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 5.- Continued.



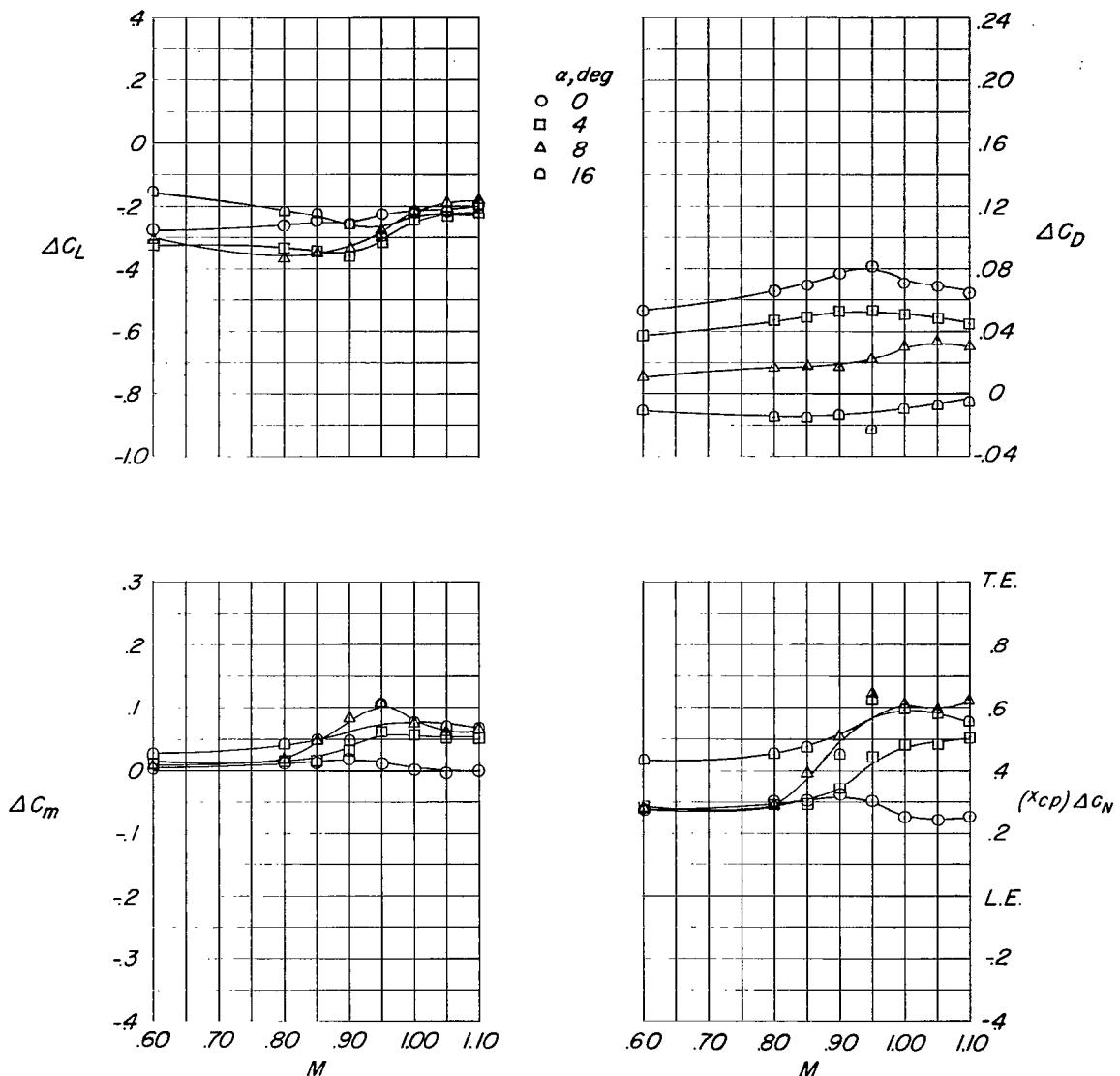
$$(d) \quad \lambda = 1.00; \quad \Delta c/4 = 45^\circ; \quad \delta_s = -0.075c; \quad \frac{\partial d}{\partial s} = 0.75.$$

Figure 5.- Concluded.



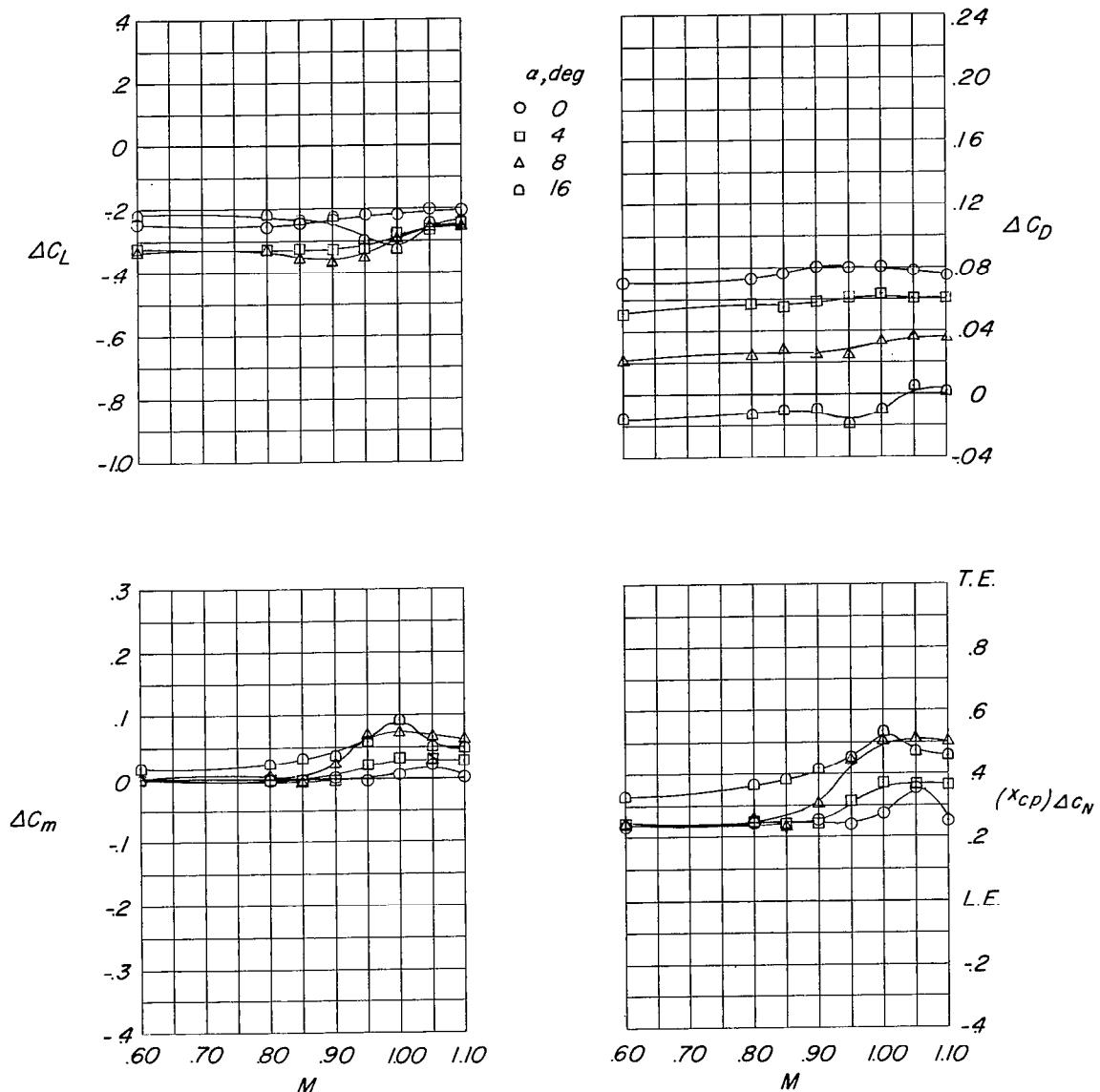
$$(a) \quad \Lambda_c/4 = 0^\circ; \quad \lambda = 1.00; \quad \delta_s = -0.075c; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 6.- The effect of angle of attack on the variation of the incremental lift, drag, and pitching-moment coefficients, and center of pressure with Mach number for the spoiler-slot-deflector configuration on wings having sweeps of  $0^\circ$ ,  $15^\circ$ ,  $30^\circ$ , and  $45^\circ$ .



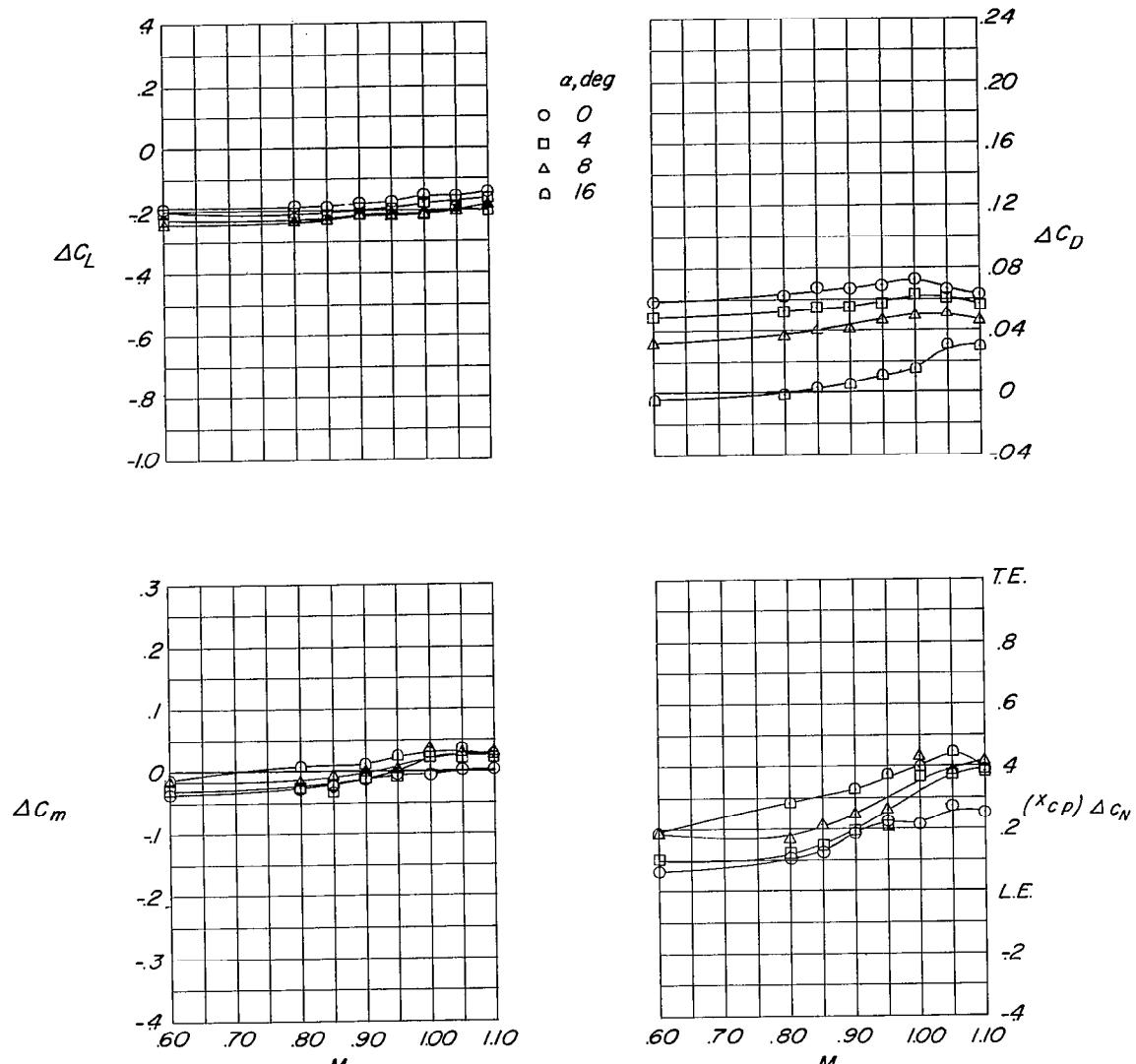
$$(b) \quad \Lambda_c/4 = 15^\circ; \lambda = 1.00; \delta_s = -0.075c; \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 6.- Continued.



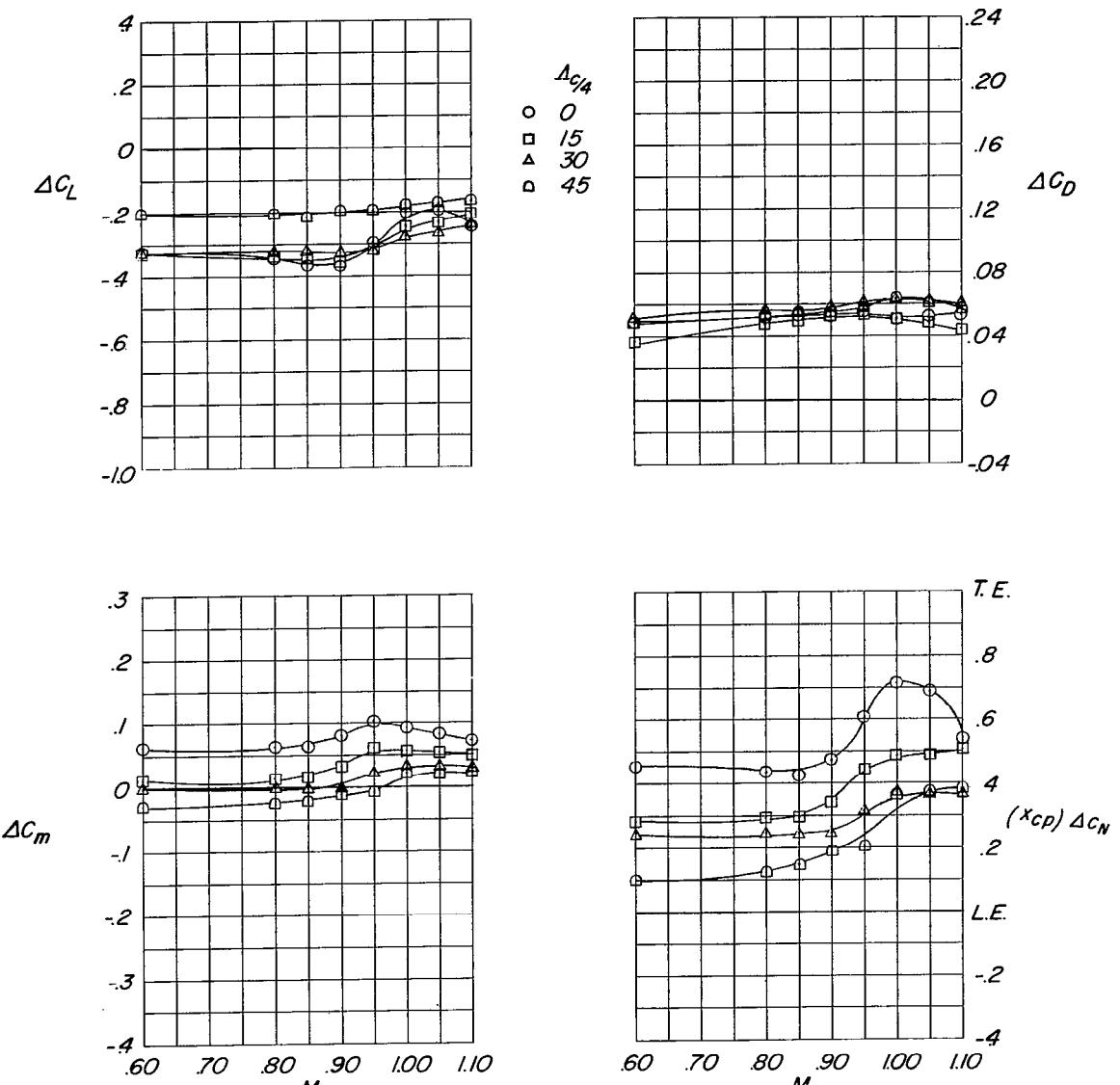
(c)  $\Delta c_{l_4} = 30^\circ$ ;  $\lambda = 1.00$ ;  $\delta_s = -0.075c$ ;  $\frac{\delta_d}{\delta_s} = 0.75$ .

Figure 6.- Continued.



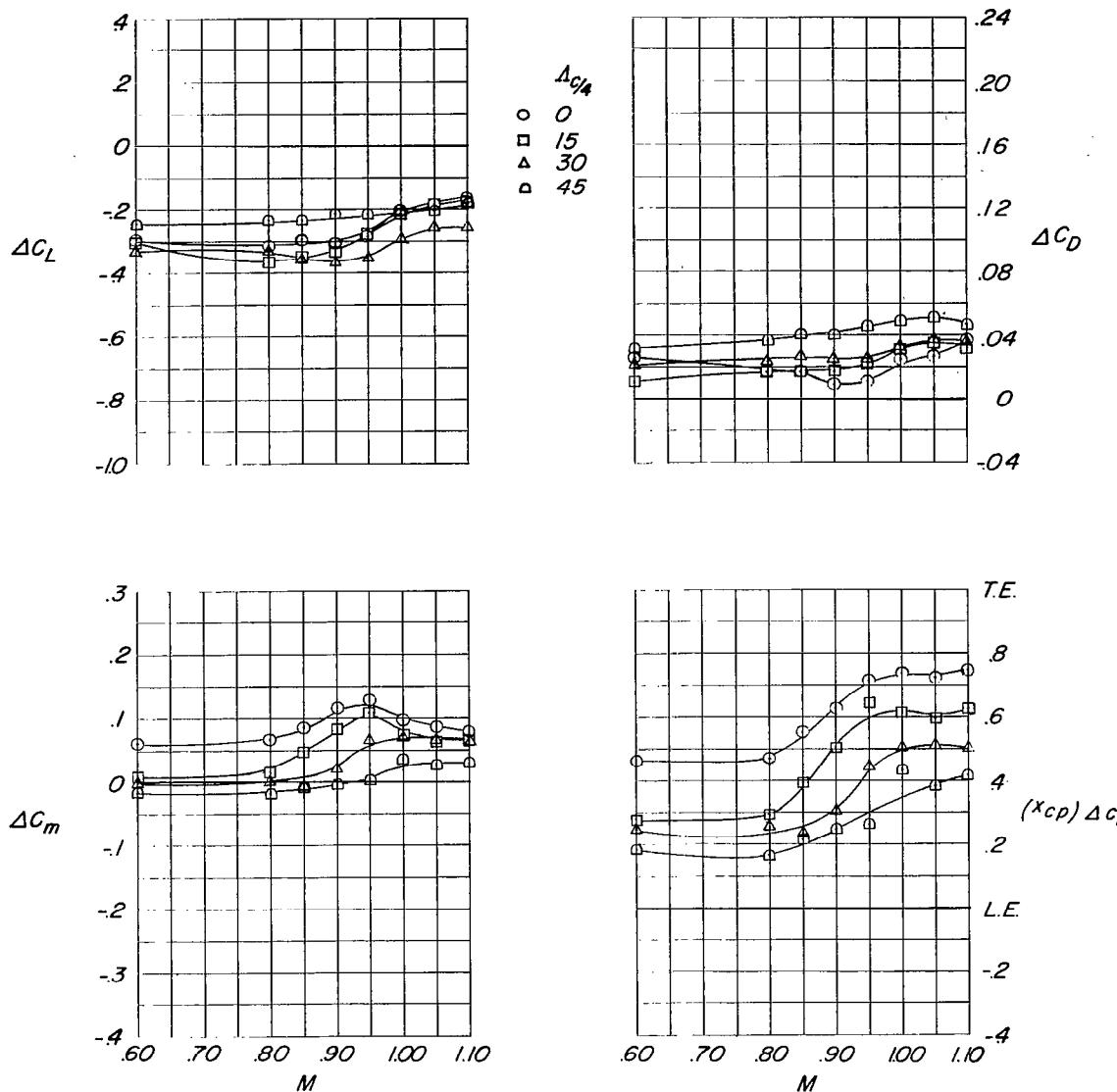
$$(d) \quad \Lambda_c/4 = 45^\circ; \quad \lambda = 1.00; \quad \delta_s = -0.075c; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 6.- Concluded.



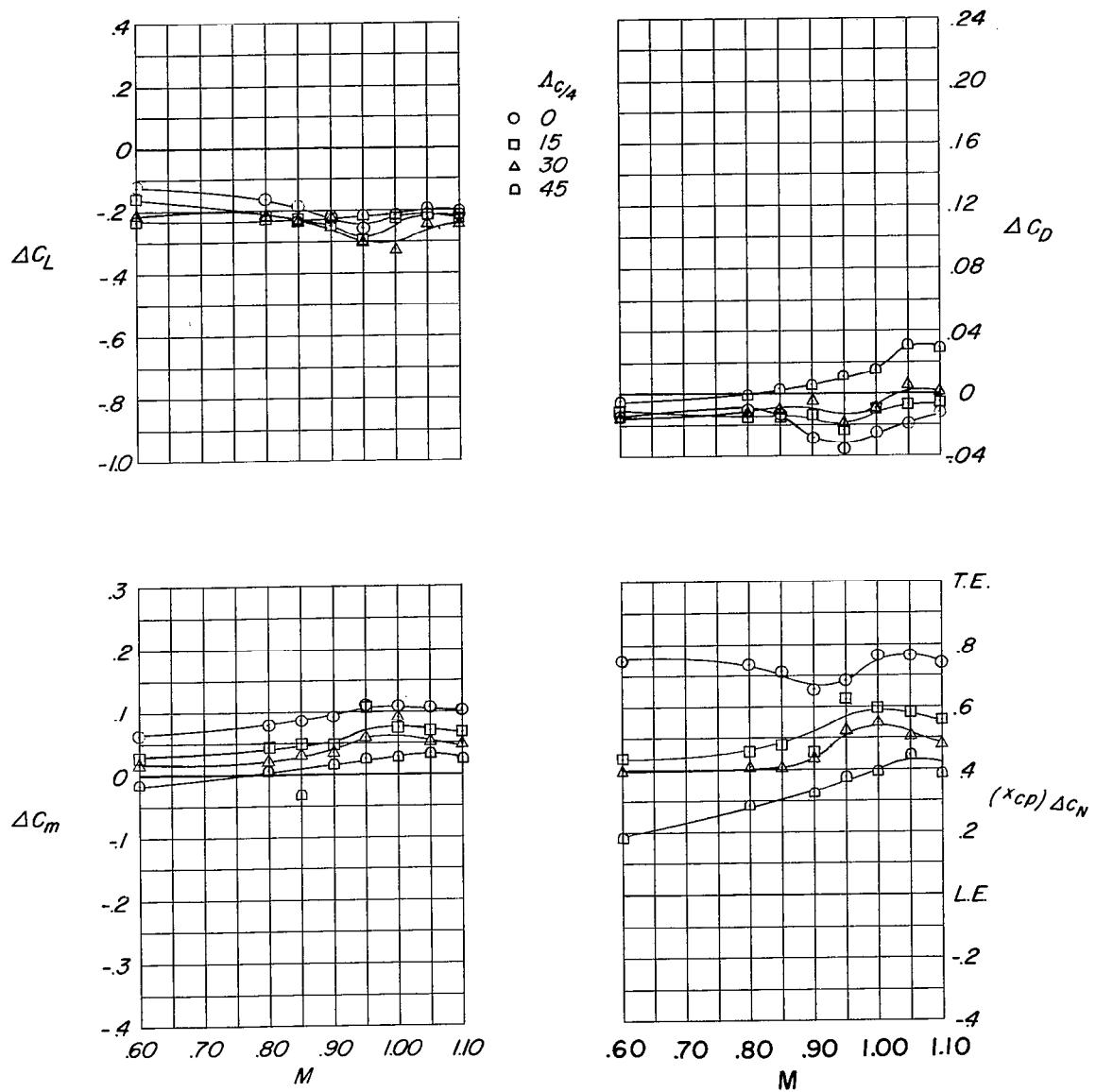
$$(a) \quad \alpha = 4^\circ; \lambda = 1.00; \delta_s = -0.075c; \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 7.- The effect of wing sweep on the variation of the incremental lift, drag, and pitching-moment coefficients, and center of pressure with Mach number for the spoiler-slot-deflector configuration at several angles of attack.



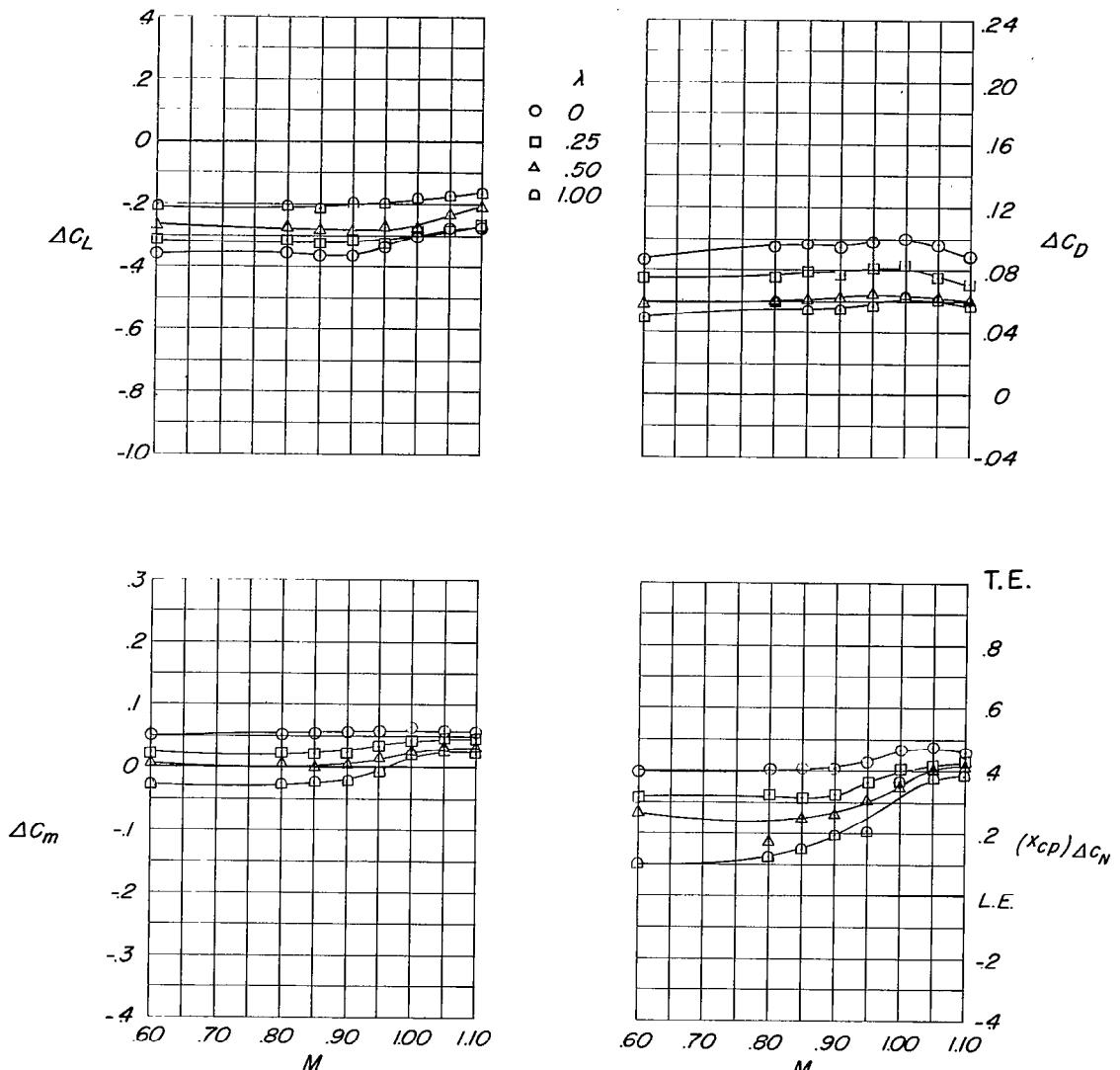
(b)  $\alpha = 8^\circ; \lambda = 1.00; \delta_s = -0.075c; \frac{\delta_d}{\delta_s} = 0.75.$

Figure 7.- Continued.



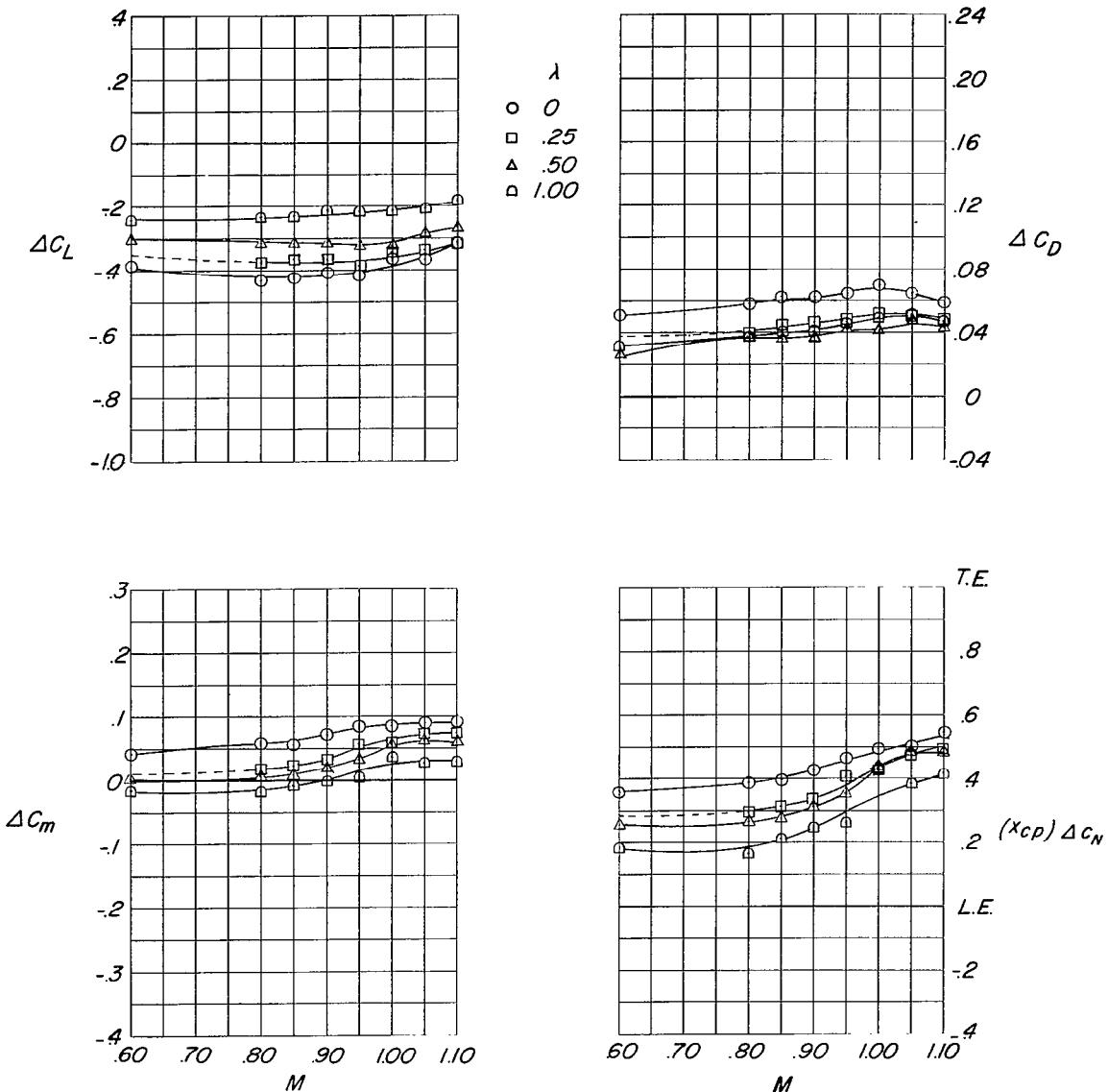
(c)  $\alpha = 16^\circ$ ;  $\lambda = 1.00$ ;  $\delta_s = -0.075c$ ;  $\frac{\delta_d}{\delta_s} = 0.75$ .

Figure 7.- Concluded.



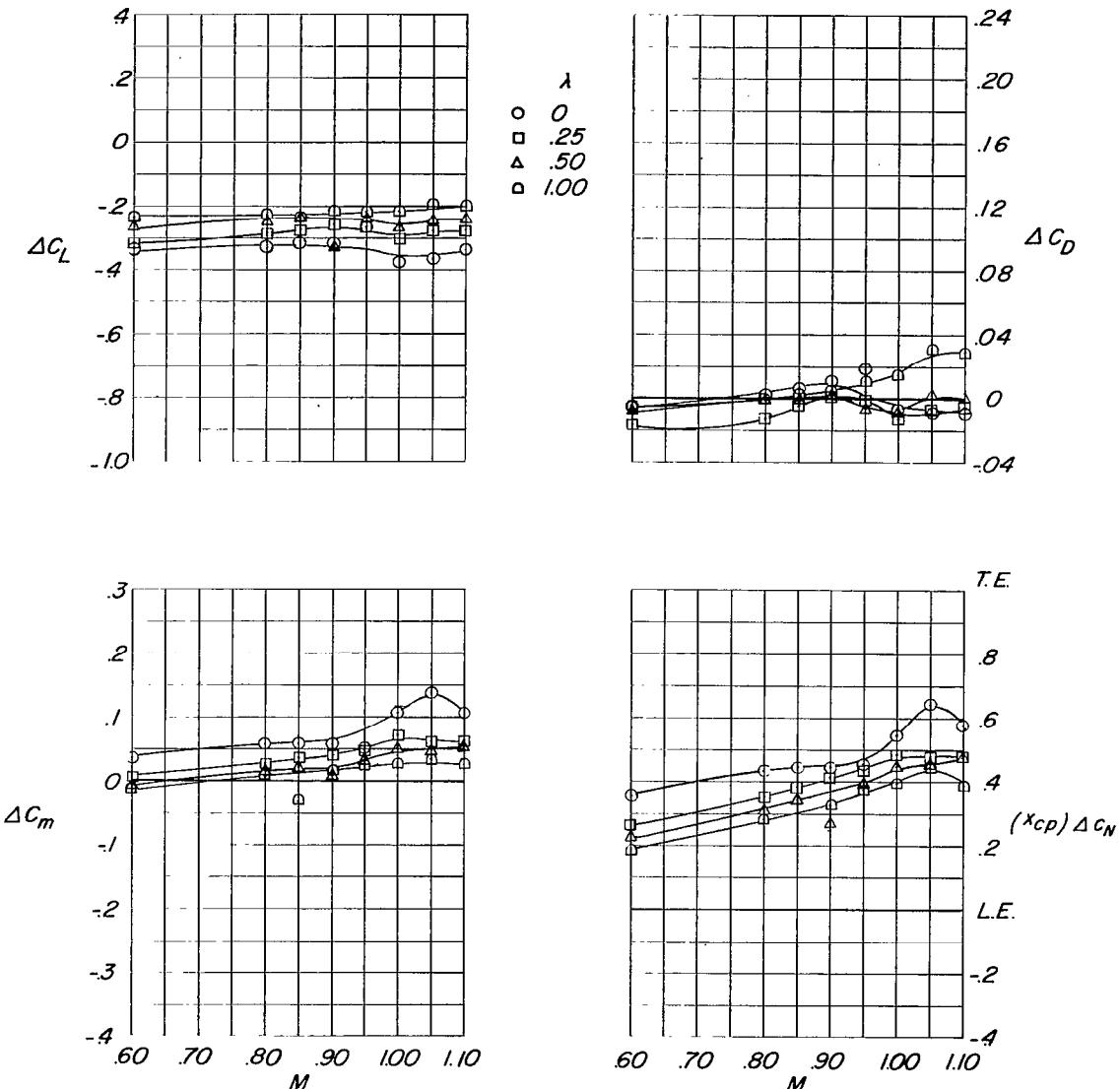
$$(a) \quad \alpha = 4^\circ; \quad \Lambda_c/4 = 45^\circ; \quad \delta_s = -0.075c; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 8.- The effect of wing taper ratio on the variation of the incremental lift, drag, and pitching-moment coefficients, and center of pressure with Mach number for the spoiler-slot-deflector configuration on the  $45^\circ$  swept wings at several angles of attack.



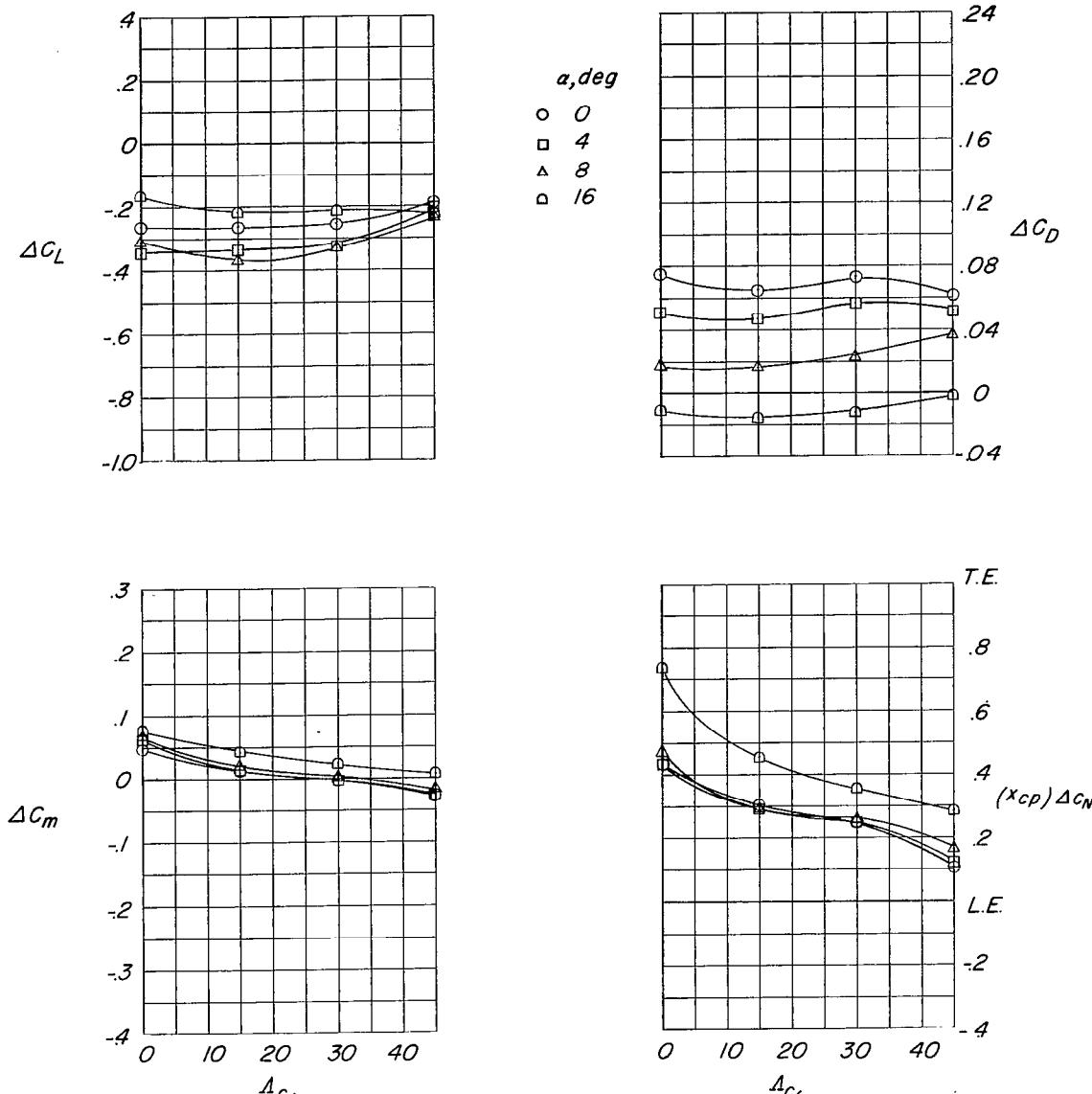
(b)  $\alpha = 8^\circ$ ;  $\Lambda_c/4 = 45^\circ$ ;  $\delta_s = -0.075c$ ;  $\frac{\delta_d}{\delta_s} = 0.75$ .

Figure 8.- Continued.



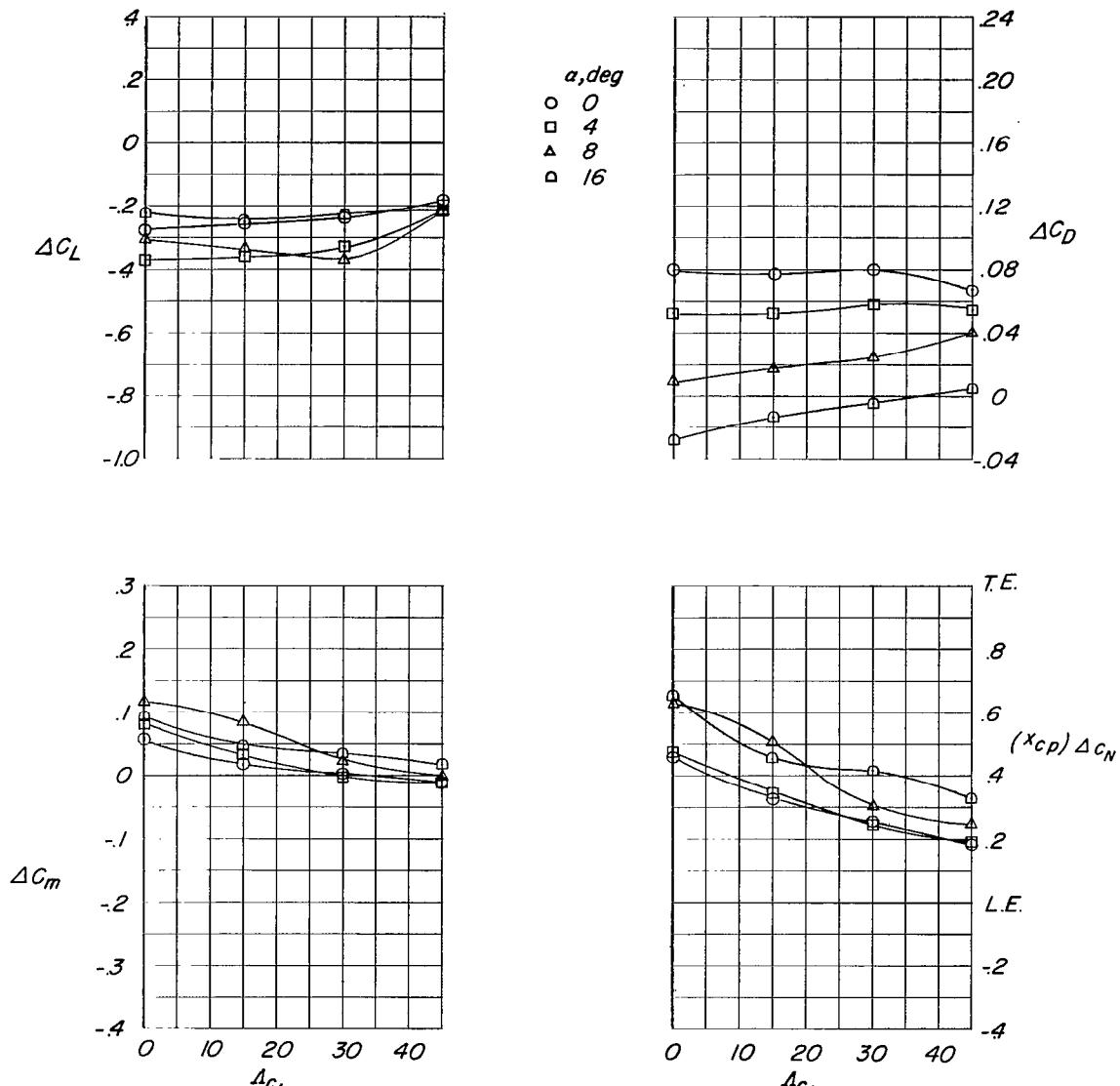
$$(c) \quad \alpha = 16^\circ; \quad \Lambda_c/4 = 45^\circ; \quad \delta_s = -0.075c; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 8.- Concluded.



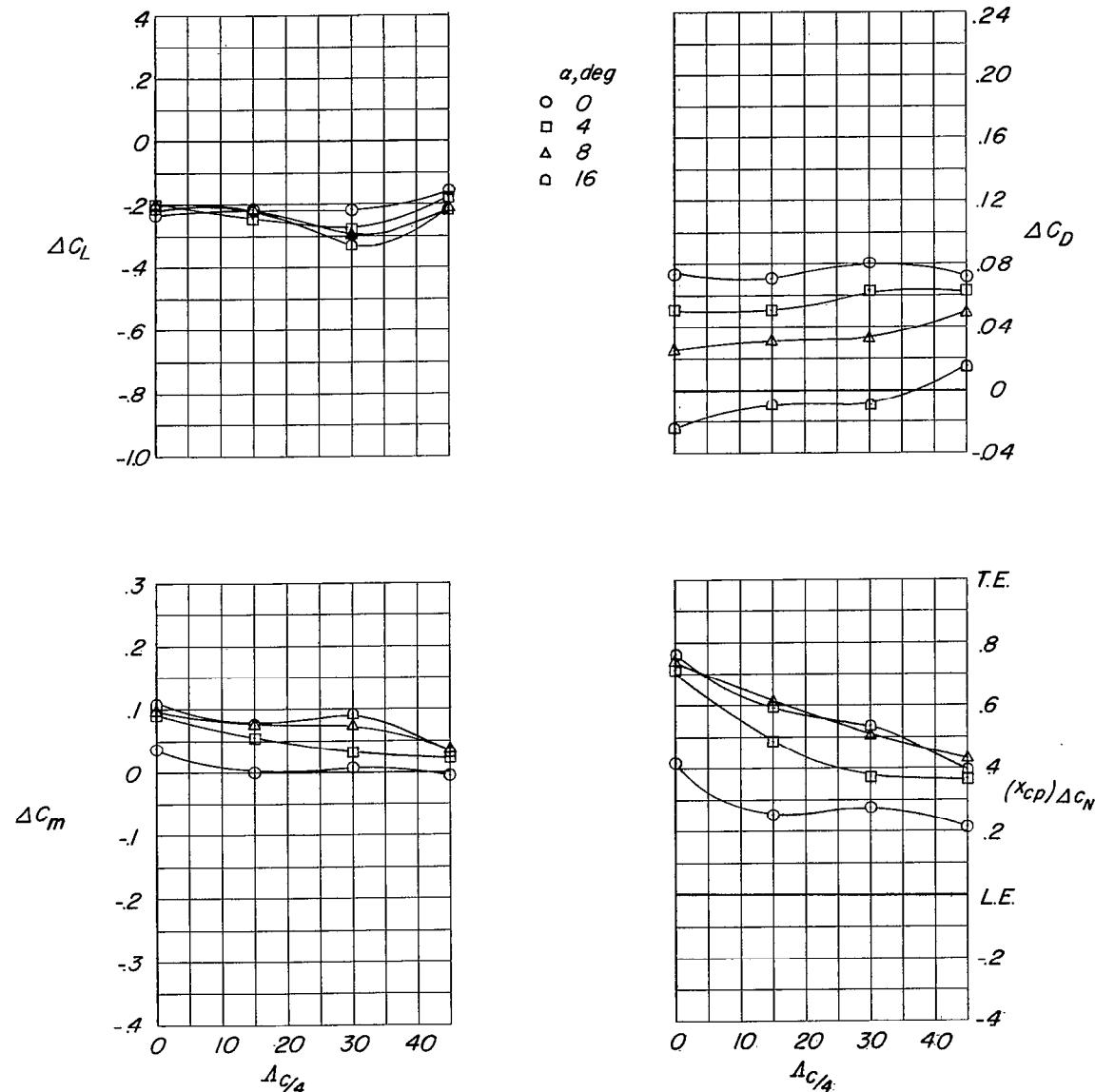
(a)  $M = 0.80; \lambda = 1.00; \delta_s = -0.075c; \frac{\delta_d}{\delta_s} = 0.75$ .

Figure 9.- The effect of angle of attack on the variation of the incremental lift, drag, and pitching-moment coefficients, and center of pressure with wing sweep for the spoiler-slot-deflector configuration on the untapered wings at Mach numbers of 0.80, 0.90, and 1.00.



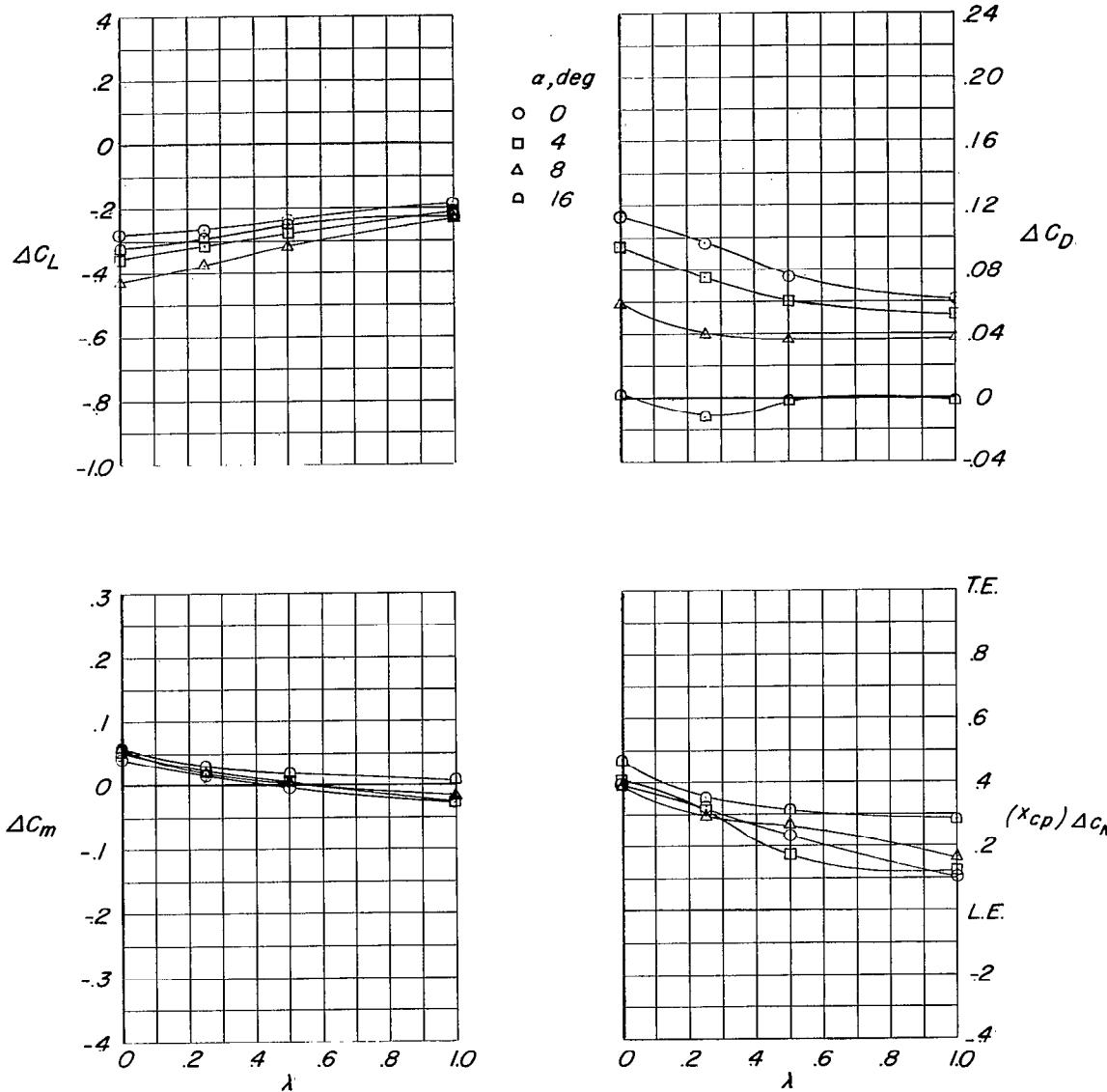
(b)  $M = 0.90; \lambda = 1.00; \delta_s = -0.075c; \frac{\delta_d}{\delta_s} = 0.75.$

Figure 9.- Continued.



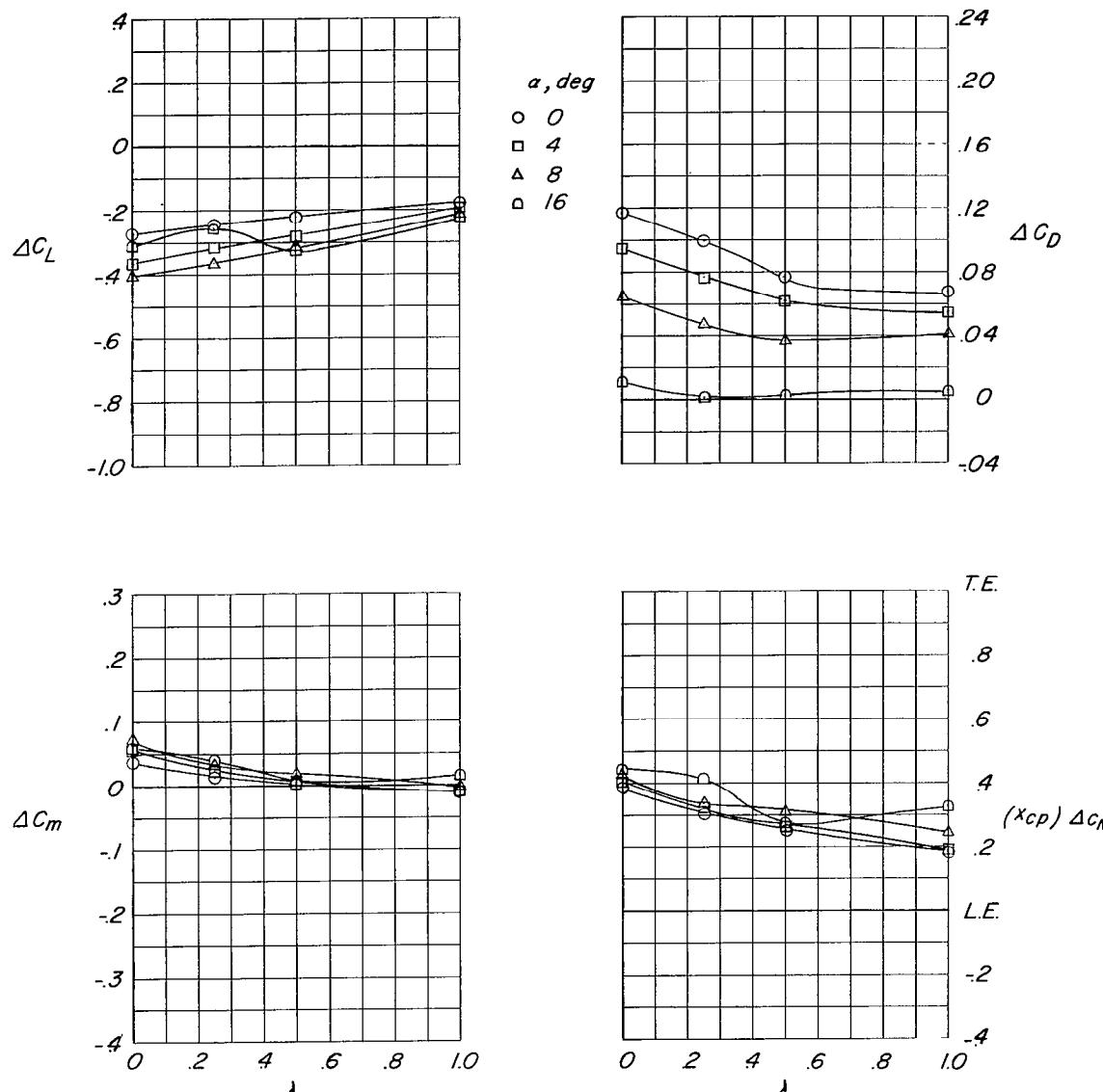
(c)  $M = 1.00; \lambda = 1.00; \delta_s = -0.075c; \frac{\delta_d}{\delta_s} = 0.75$ .

Figure 9..- Concluded.



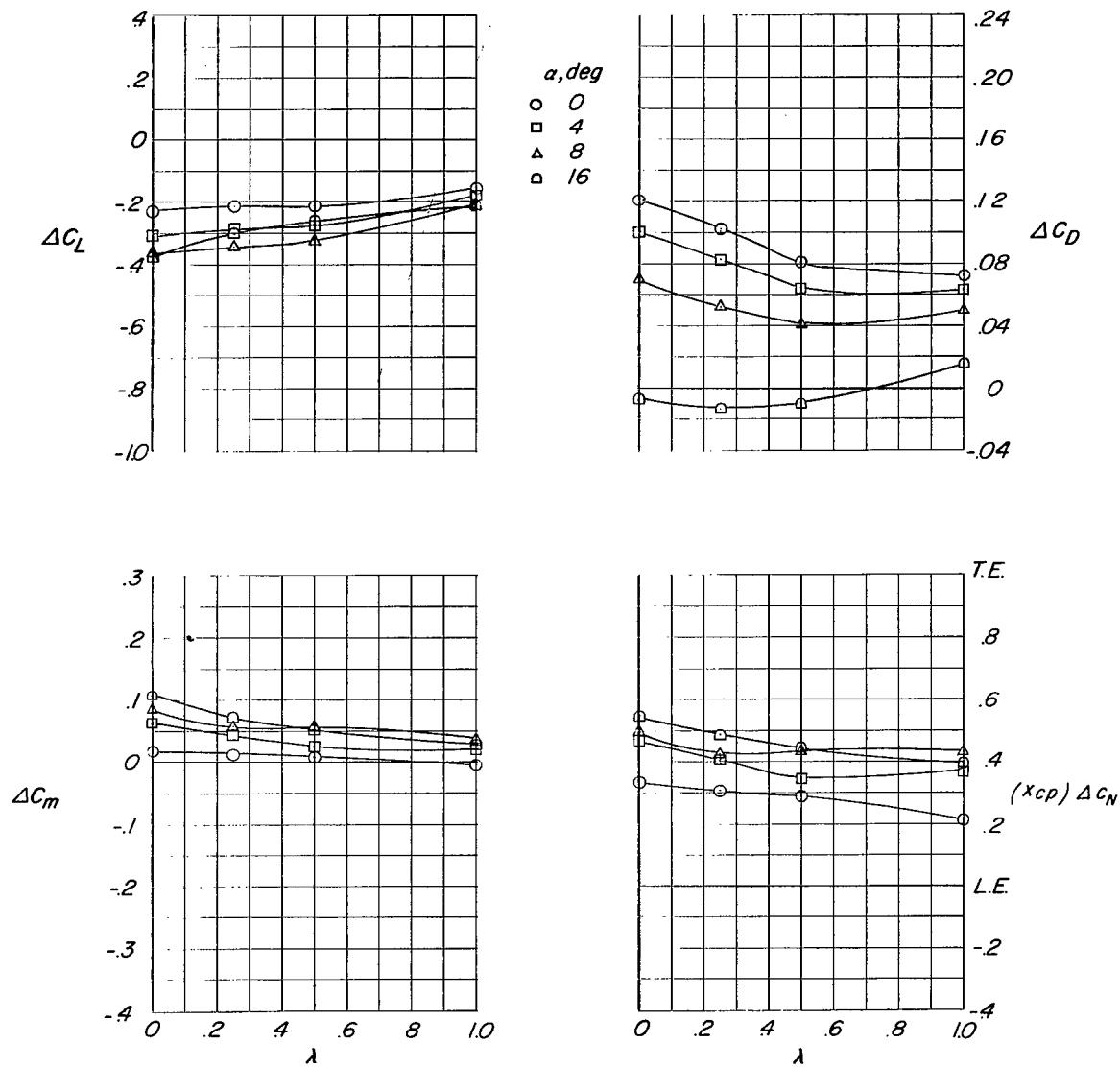
$$(a) \quad M = 0.80; \quad \Lambda_C/4 = 45^\circ; \quad \delta_s = -0.075c; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 10.- The effect of angle of attack on the variation of the incremental lift, drag, and pitching-moment coefficients, and center of pressure with taper ratio for the spoiler-slot-deflector configuration on the  $45^\circ$  swept wing at Mach numbers of 0.80, 0.90, and 1.00.



(b)  $M = 0.90$ ;  $\Lambda_c/4 = 45^\circ$ ;  $\delta_s = -0.075$ ;  $\frac{\delta_d}{\delta_s} = 0.75$ .

Figure 10.- Continued.



$$(c) \quad M = 1.00; \quad \Lambda_C/4 = 45^\circ; \quad \delta_s = -0.075c; \quad \frac{\delta_d}{\delta_s} = 0.75.$$

Figure 10.- Concluded.

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